

MOTOR AGE

Vol. XXXI
No. 3

CHICAGO, JANUARY 18, 1917

10 cents a copy
Three dollars a year

Will You Be Handling the Front Rank Car in 1917?

WOULDN'T YOU RATHER SELL
THAT KIND OF CAR — THE

HUDSON SUPER-SIX

Last year Hudson dealers had the most wanted car in the world. They could not begin to get enough Super-Sixes to fill orders.

Other dealers, you perhaps, took the overflow. You took the buyers that Hudson had to lose because there were not enough Super-Sixes to go around.

*Are you content to remain the
dealer in the Second Choice Car?*

Or would you rather sell the car that your second choice buyers want, and will eventually buy—the Hudson Super-Six?

This year the Super-Six continues the Supreme car. No other car has approached it in performance and popularity.

To represent such a fine car makes you the leader. Dealers who hold the Hudson franchise must be men of recognized merchandising ability. Hudson is always growing. New territories are constantly being created. For that reason if you think you personify the Hudson dealer ideal you should make yourself known to us. The time may come when it would become profitable to both of us.



HUDSON MOTOR CAR COMPANY
DETROIT, MICHIGAN

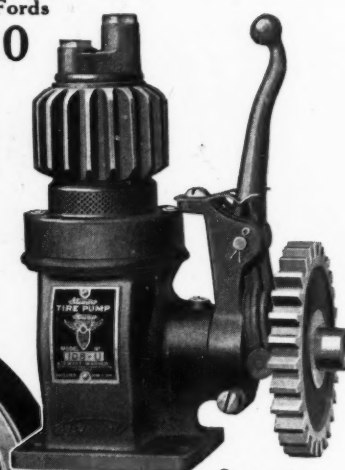
*Largest makers of Fine Cars in the World.
Hudson Super-Six holder of all worth-while records.*

HUDSON SUPER-SIX

Stewart
Motor Driven
Warning Signals
\$6



Stewart
Speedometer
for Fords
\$10



Stewart
Tire Pump
\$12

Stewart Products



Stewart
Speedometer
\$25

Progressive Dealers Know It Pays to Sell Leaders Only

Live dealers everywhere—men who do a big business and are making big money—know by experience that it pays to sell **LEADERS ONLY**. They stock, sell and feature Stewart Products. The wide demand for Stewart Products is extremely significant to the wise dealer. It points out to him the unmistakable trend of public opinion—the tremendous demand for the best known and most widely advertised automobile accessories on the market.

The dealer who has achieved really big success does not waste his time, energy and money in trying to "put across" unknown accessories. He banks on a steady, consistent "turnover." He handles the one established line—the one that is universally accepted as standard. He carries a complete stock of Stewart Products.

Stewart Products offer you a steady source of income all year 'round—not only in Summer, but also in Winter when you need it most. Determine right now to sell nothing but Leaders. Concentrate on "boost," feature and sell Stewart Products—the fastest-selling and easiest-to-sell of all automobile accessories.



Stewart
Vacuum System
\$10



Stewart
Hand Operated
Warning Signal
\$3.50

Warner
Auto-Meter
\$50

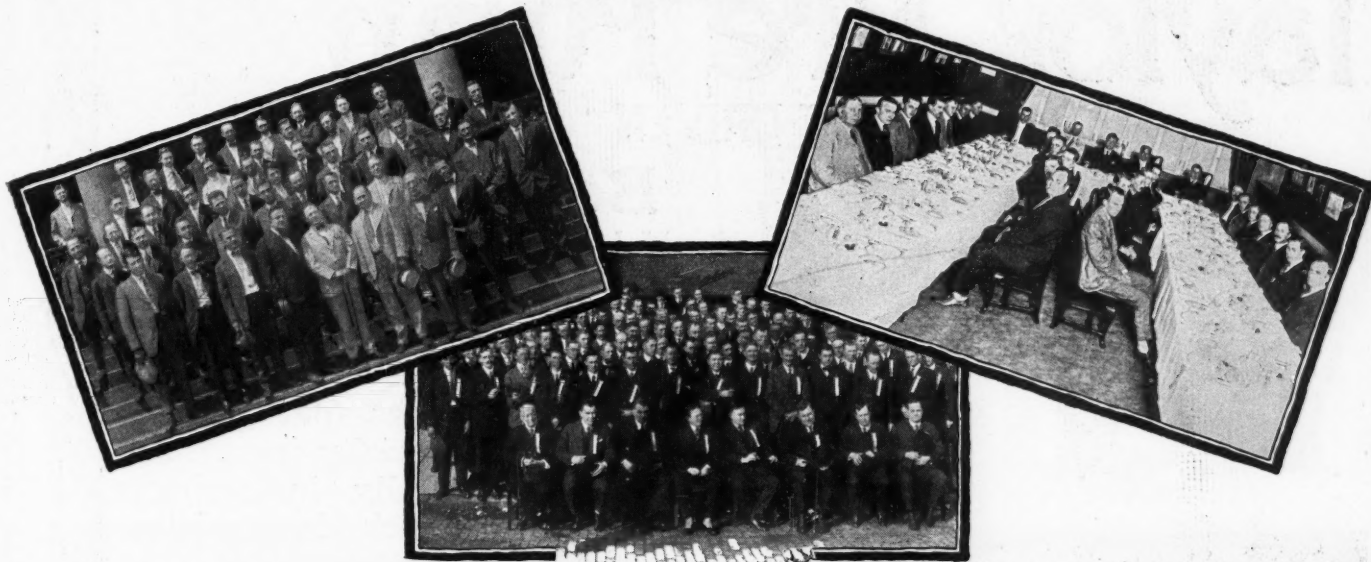


Stewart
Spark Plug
\$1

*The Stewart-Warner
Speedometer Corporation*
Chicago, Illinois, U.S.A.

Studebaker

Established 1852



THAT both the products and policies of Studebaker are particularly liberal in the benefits to the dealer is evidenced by the extreme satisfaction voiced by over 6,700 men who represent it in all parts of the country. These photographs show but a few of the many enthusiastic dealers' meetings conducted by Studebaker throughout the year.

Studebaker dealer connections are based on something more than a general agreement as to territory

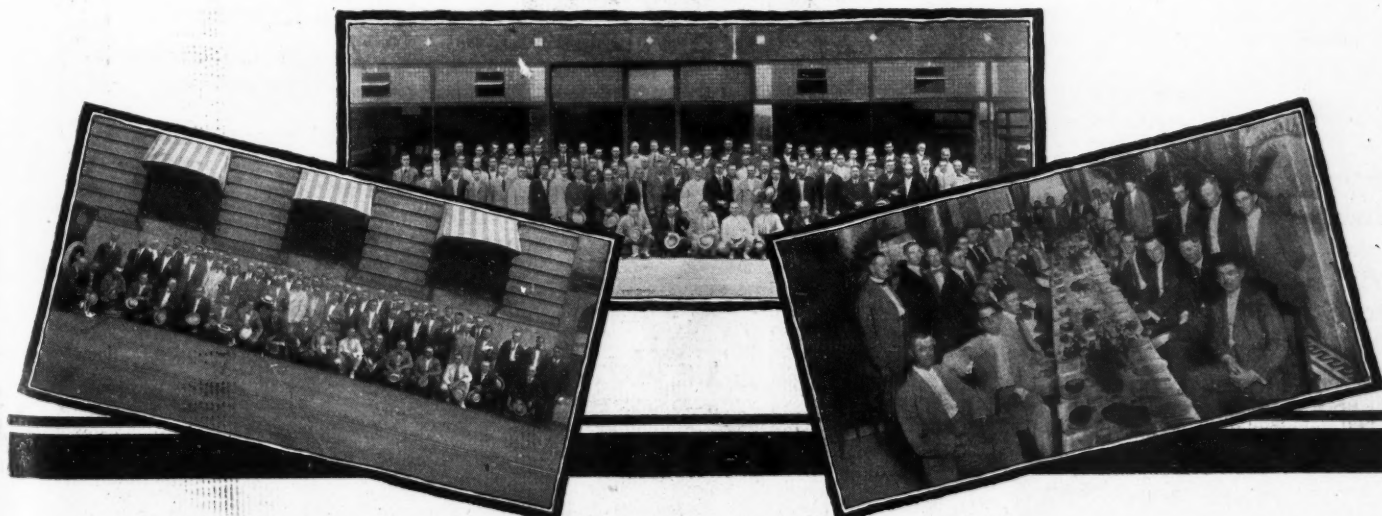
and yearly quota of sales. The requirements involved are rigid and exacting, but once the relationship is established, every proved method of co-operation is employed by the Studebaker Sales Department that will tend to build prestige for the dealer and increase his profits.

The reasons why these dealers regard their association with Studebaker as such a strong asset may be of interest to you.

STUDEBAKER

South Bend, Ind. Detroit, Mich. Walkerville, Ont.

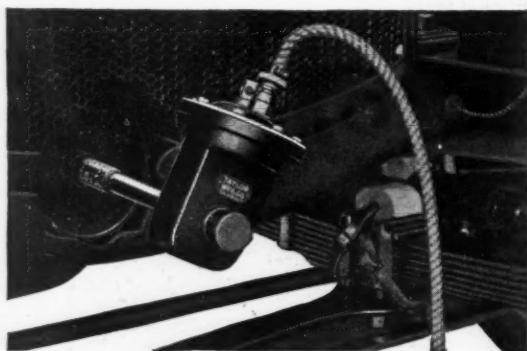
Address all correspondence to Detroit



When Writing to Advertisers, Please Mention Motor Age

Taylor Tire Pump

CRANK SHAFT DRIVEN



Fitted to

Hudson	Stearns-Knight
Overland	Mercer
Willys-Knight	Grant
Dodge	Saxon
Chandler	Regal
Reo	and others
Special type for Fords	

Begin Now To Make Your Tires Run Farther

Quality in automobile tires is gauged in mileage per dollar invested.

Every one knows that proper tire inflation materially increases mileage, incidentally increasing the ease with which the vehicle rides.

The Taylor Tire Pump (crank shaft driven) is sold on an investment basis—for it makes possible an easy and convenient saving of many dollars during each season. Regularly used it will pay for itself in no time, then go right on paying back an enormous revenue in the form of added miles.

It is doubtful if there is available another motor car accessory capable of earning such a large return on the money invested.

Simple to use—just fasten to the end of the crank shaft. Always dependable—cannot possibly injure your motor. When not in use it is tucked away in the tool box. There's a satisfying sense of security in the Taylor Pump—in itself worth the full price.

\$10 Ready to Use
No Installation Expense

Its bone-dry cylinder pumps into the tires air which lengthens their life. Oil cannot possibly enter the tubes.

You've heard your friends tell about their wonderful tire mileage records—here's your opportunity to equal them for the small investment of \$10. There's no installation expense—just as easy to attach as the radiator cap.

If your dealer hasn't Taylor Pumps send \$10 direct. You'll say it's the best investment you ever made.

Taylor Manufacturing Co.
REDFORD MICHIGAN

MOTOR AGE

Published Every Thursday by the
CLASS JOURNAL COMPANY
Mallers Building
CHICAGO ILLINOIS

Entered at Chicago as Second-Class Matter—Member of the Audit Bureau of Circulations—Copyright, 1916, by the Class Journal Co.

United States, Mexico and U. S. Possessions. One Year \$3.00
Canada One Year \$5.00
All Other Countries in Postal Union One Year \$6.00
BEWARE OF SUBSCRIPTION SOLICITORS OFFERING PREMIUMS OR CUT RATES—ALL CURRENCY SHOULD BE SENT BY REGISTERED MAIL.

RENEWALS or CHANGES OF ADDRESS should be sent two weeks in advance of date they are to go into effect. Be sure to send old as well as new address to avoid unnecessary delay. RECEIPT of first copy is acknowledgement of subscription.

Vol. XXXI January 18, 1917 No. 3

Contents

AMERICA'S RIVIERA.....	5
Pass Christian, Gulfport and Biloxi	
CALIFORNIA DEVELOPS CIVIL WAR.....	10
MILWAUKEE SHOW HUGE SUCCESS.....	11
EDITORIAL—THE BRIMMING POCKETBOOK— SAFETY AT CROSSING.....	12
MAY BRING VANDERBILT CUP EAST.....	13
NATURAL RESULTS.....	14
New York show aftermath	
AND WE TALK OF ECONOMY.....	16
S. A. E. annual meeting	
CONQUERING DEATH VALLEY.....	18
JACKSON HIGHWAY BRANCH IN ALABAMA..	22
GAS PRICES STILL SOARING.....	23
COMING—\$9,500 CHASSIS.....	24
WITH AMBITION TO MAKE USEFUL THINGS— CHARLES W. STIGER.....	26
HEADLIGHT GLARE CLEARLY DEFINED.....	28
ELECTRICAL EQUIPMENT OF THE MOTOR CAR	30
POEM—TAMIAMI TRAIL.....	34

DEPARTMENTS

FROM THE WOMAN'S VIEWPOINT.....	32
REPAIR SHOP.....	37
READERS' CLEARING HOUSE.....	38
ACCESSORY CORNER.....	42
FROM THE FOUR WINDS.....	44
AMONG THE MAKERS AND DEALERS.....	45

ANNOUNCEMENT

The Chicago Show Number of Motor Age, which will bear the date of Jan. 25, will cover the accessory field and give a complete history of all Chicago shows. In addition there will be many feature stories that will portray the magnitude of the western metropolis as a distribution center for cars and parts.

We have ceased to boast about casings that go 8,000 or even 12,000 miles. Really, that is a commonplace performance for

Kelly-Springfield Tires

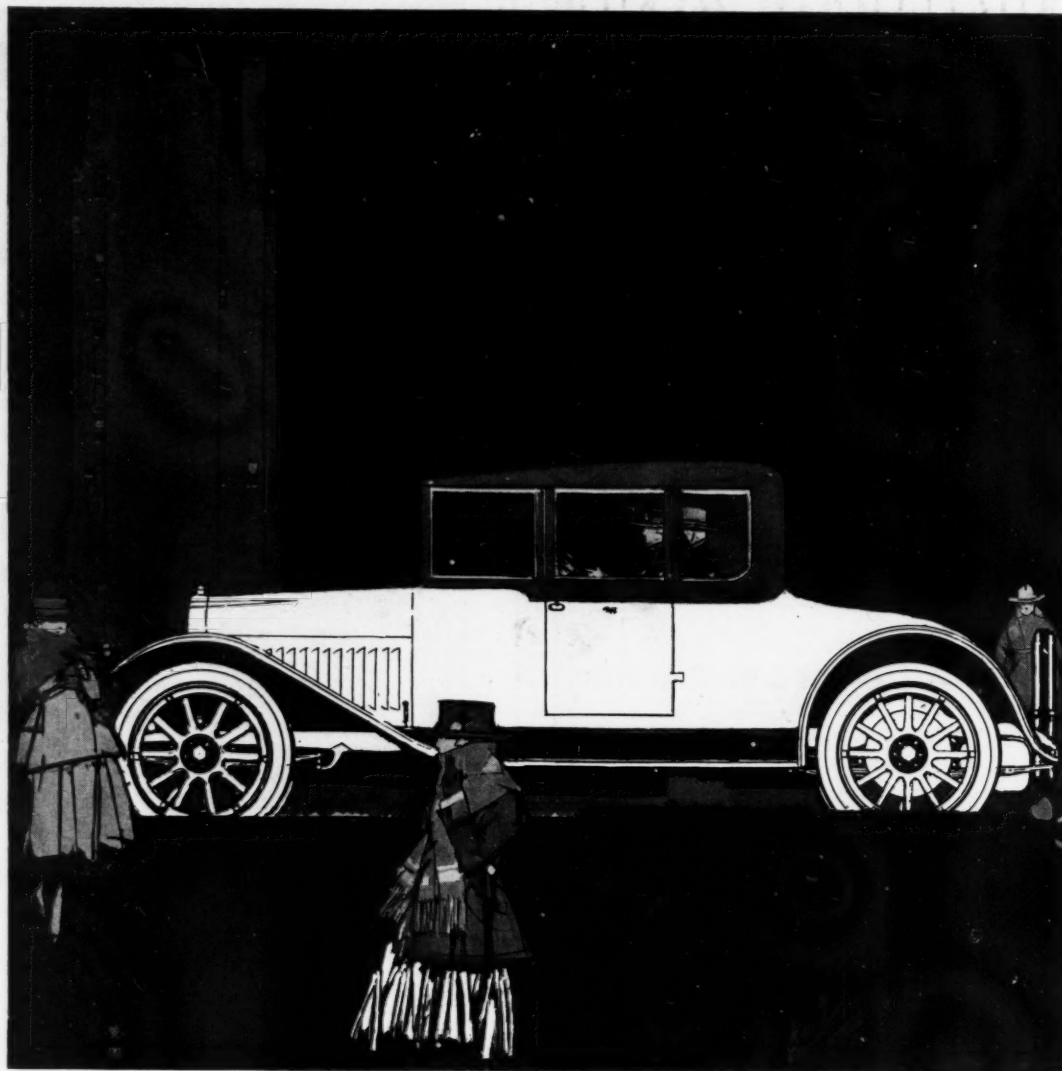
We blush for the occasional tire which fails to deliver to its owner the guaranteed mileage, but when that happens—which is seldom—we make the adjustment promptly and pleasantly.

Kelly-Springfield Tire Co.

Executive Offices
Broadway at 57th Street
New York

General Sales Department
1900 Euclid Avenue
Cleveland, O.





White Sixteen valve 4

Marked individuality of appearance in high grade cars is attained either by remaining behind general progress in body design, or by keeping so far in advance of it that popular tendencies are transcended and anticipated.

White bodies are highly individual in being markedly progressive within the conservative bounds of good taste.

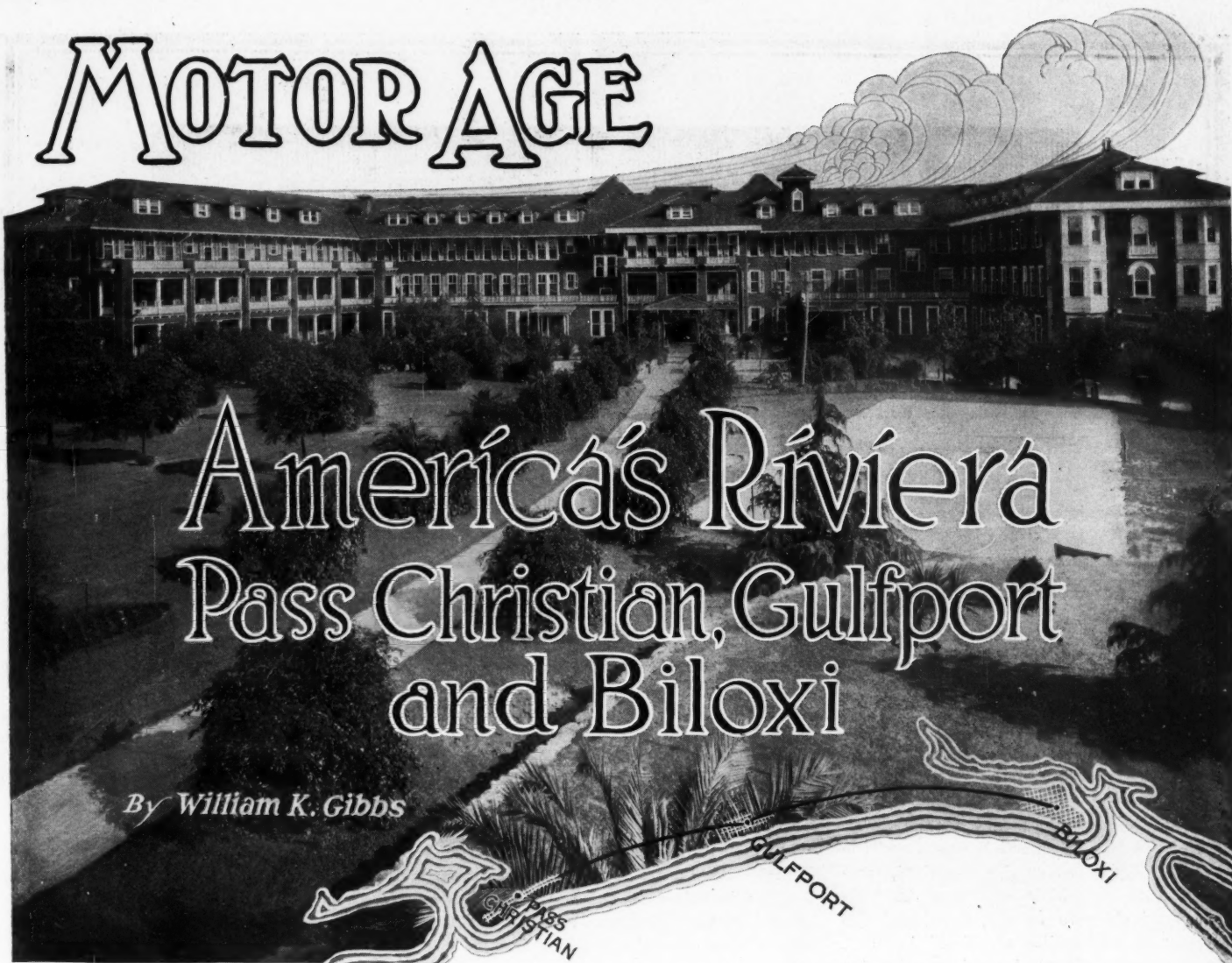
Upholstery and finish may be selected to suit the owner's individual taste.

THE WHITE COMPANY

Cleveland



MOTOR AGE



By William K. Gibbs

The Great Southern hotel at Gulfport, Miss. The grounds of this hostelry, as well as the hotel itself, are very inviting

PARALLELS or counterparts may be found for almost, if not quite everything, if we look for them. The liberty of paraphrasing is taken with due respect, in this case, for generalities, not for particulars. France has her Riviera on the northern coast of the Mediterranean, although Italy claims a part of this famous resort. America has her Riviera on the Gulf Coast of southern Mississippi. I once thought of the Riviera as a place for invalids, as perhaps you have, but it seems logical that a place that guides the minds of invalids toward a better understanding and gives them relief, must be doubly appealing to those who have no bodily or mental ills. The spell of America's Riviera will hold you; make you want to linger long past the time you planned to direct your course toward home. I say this without reservation; one seldom, if ever, finds parting from this inspiring section of the Gulf Coast an easy matter.

Where Winter Is Warm

To you who feel the wanderlust, that unsatisfied calling for other lands and the sight of other faces; to you who would reach out for knowledge of places and conditions, or peoples and customs, to you

who revel in piscatorial sports that made Izaak Walton famous, and lastly to you who are in search of health-giving air, mild climate and beautiful surroundings, I advise trading a northern winter for one of the southern variety, and in making the trade insist upon getting the real Riviera brand. This you can get only on a short stretch of the Gulf Coast in southern Mississippi. Here Nature has given her master stroke to surroundings that forms a picture with an appeal that makes one loathe to leave for places less favored by the Great Artist.

Riviera French-Settled

France has her Riviera and it seems quite appropriate that America's Riviera should have had its traditions traceable to France. The first colony in Mississippi had its inception on the bay of Biloxi in 1699, when LeMoynes d'Iberville brought a handful of French to a part of that section now designated in the title of this article. The brave little band of colonists finally found that a narrow strip of land on the border of a vast, unexplored continent, with hostile red men imminent was too large a problem for them and so 64 years afterward they ceded their land to the British

and left for other sections, but the French influence has been deeply impressed on the entire section.

America's Riviera has been favored by Nature from the very beginning of time. Historians tell us this—in the long ago there were glowing accounts of the climate, the beauty of its scenery, the healthfulness of its hospitable shores. Writers of current events know well that the beauty of Biloxi and the Gulf coast has never faded; that the picture presented from where the rolling billows strike the shores of the beach far into the inland, the out-of-doors has never failed to please the eye of the pleasure-seeking visitor.

Three Objective Points

This story must necessarily be divided into three parts, for there are three objectives in this particular strip of coast that I have designated as America's Riviera, and each has its individualities. Pass Christian is at the extreme western end of the strip; Gulfport is about midway between Pass Christian and the other extreme—Biloxi. Let us first delve into the history, formation and natural beauty of "The Pass," as Pass Christian is abbreviated by its intimates.



Immediately above is Miss Herndon's cottage that since it was occupied by President Wilson, has been termed the winter "White House." At the right is the home of Albert Aschaffenberg, of New Orleans. These are typical of the homes to be found along the shell drive through Pass Christian, Miss.

Pass Christian

IT WAS after many and long buffetings of waves and winds that a small boat, manned by the adventurous sons of Norway, worked its way across choppy waters of the Gulf of Mexico, through low-lying islands of pines and bare reefs of shell, into the broad basin of tranquil waters of a sound. As they looked into this haven one of the men in the bow looked back at the bronzed, sun-and-salt-soaked captain. "Christian," he said, "Pass Christian." Thus, was named the pass and the town they founded on the beautiful, tree-lined shore on which they landed. This landing, it is safe to say, antedated the coming of d'Iberville at Biloxi in 1699. Years passed. New Orleans became a city and Pass Christian a summer and winter playground. Villas sprang up all along the beach; children played in the silver sands while the elders swam in the salt waters or danced in the broad galleries of their homes.

Living No Exertion

Living seems to be no exertion in the Pass. A climate, tempered by the warm winds of the Gulf, makes the bite of a northern winter unknown here. Neither are there scorching rays of the sun in summer; the winds from the Gulf temper the atmosphere at all times.

The Pass, to use a homely expression, "is all long and no wide." Lying between a background of pines and oaks, magnolias and other trees on one side and the shimmering waters of the Gulf on the other, and with one main street—in this case a shell road—seven miles long, one could not get lost in the Pass. The road skirts the Gulf closely and on the side opposite from the Gulf are homes that are veritable castles. These homes with their shrubby settings that represent the highest skill of the landscape gardener, are where the "hard-working" New Orleans business man — the quotes are used with reverse English in this case, because New Orleans people are play gourmands—and the northerners who can afford winter homes, find solace.

Along this live oak, Spanish moss-festooned avenue that shimmers in noon-day sun and under the glow of motor car headlights at night, many presidents and others of note have had homes or spend a part of their time. The Pass seems to have a peculiar charm for presidential timber. Crowned in the glory of his Mexican achievements, Gen. Zachary Taylor visited the Pass and shortly afterwards entered the White House; his grand-daughter, Mrs. Walter Stauffer, of New Orleans, owns one of the finest homes here; Judge Alton B. Parker, after his defeat for the Presidency,



All along the Gulf coast in the American Riviera, the shell boulevard is canopied by live oaks generously hung with Spanish moss, this particular view being at Biloxi, Miss.

came to the Pass to recuperate and spent several weeks at Lynne Castle; wearied and worn with work and problems, President Wilson found rest and health at Miss Herndon's cottage, which has since been known as the "winter White House"; the Roosevelts have been guests in the Pass, and ex-President Carabjal of Mexico spent some summers here also. John M. Parker, recent vice-presidential candidate of the Progressive party has a home on the broad avenue that forms the main street of the Pass.

Presidents and Pirates

If I may be pardoned the alliteration, pirates also had a penchant for the Pass as well as the presidents. The pirate LaFitte once made the Pass his treasure storehouse. Legend has it that there is a bay tree at the Pass and that on it were cut letters and odd signs. Frightened negroes, a few years ago, reported "ha'nts" moving about this particular tree with furtive tappings and flash lights. Investigation showed a large excavation running under the bay tree where shovels and pick axes had been at work and three strangers, who had arrived from Nowhere a few days previously had departed for Nowhere and their large trunk, baggage men said, which was light when it arrived was extremely heavy on departure. The interesting problem—did they find treasure?—is all that



Out over the shimmering Gulf one sees all the colorings in the clouds that only the Master Painter can blend. It is useless to attempt description, for the eye only can perceive; expression is difficult

is left. No one knows the answer and probably no one ever will. Natural beauties of the Pass have been put on canvasses and sung in song and story.

The Gulf teems with fish of many varieties, such as redfish, speckled trout, Spanish mackerel, sheepshead, flounders, croakers, white trout, mullet and pin fish. Hard and soft-shell crabs and shrimp as well as an abundance of oysters keep the canning factories busy. About a mile out in the Gulf is a famous tarpon hole that gives royal sport to the fisherman when the sun lures the tarpon to leap in the air, a silver king of beauty.

Recreation Spots

For the accommodation of visitors there are two hotels, several large boarding houses and many private ones as well as cottages to rent. One thing that there should be more of is camping sites for the motor tourist, and this is equally true of the entire section termed the American Riviera. For play there is the Country Club, picturesquely situated on the Bayou

One of Biloxi's commercial institutions, a shrimp and oyster canning factory. In the mists of the night the schooners and boats of the fishing fleet go far out, returning to the plants at dawn or early forenoon laden with denizens of the deep



Portage, and its nine-hole golf course with its background of stately pines.

And this is the Pass: The broad expanse of glistening salt water, a shore of dazzling sand, shaded by pines, magnolias and oaks; a long stretch of white shell road, hard as a rock, and strung along it, like glowing jewels, the picturesque homes surrounded by wonderful trees and shrubbery, one of the most beautiful being the oleander; roses that bloom the year around; and to the north pines and motor roads leading through citrus farms and pecan groves and over rivers and bays of marvelous colors. A visitor once remarked to a resident who had complained of a mosquito bite: "It is a good thing you people of Pass Christian have mosquitoes now and then or you would never turn your thoughts to paradise above, having your own paradise here on earth."

One of the best breakfast fish is the flounder, a gastronomic treat when properly broiled. Spearing the flounder is a picturesque bit of night fishing. The fisherman wades in the shallow water, carrying a lighted brand of pine or a gasoline torch and spears the flounder who endeavors to hide from the fisherman in the sand. In summer "floundering parties" are a form of amusement for the younger set, with the usual result of much merriment, but few fish.

There is a peculiar fascination about

the Pass, a magnetism that draws people back again and again and which one cannot explain but only marvel at. Here land and sea and sky blend into a picture, the alluring subtlety of which no artist could imprison on canvas or poet reduce to rhyme and meter. A belief that is almost unanimous is:

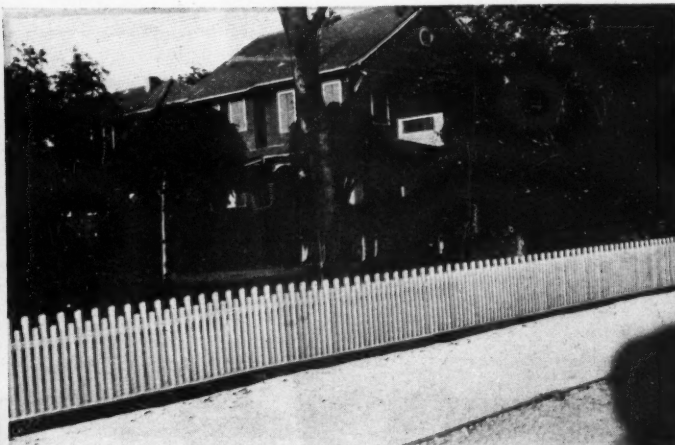
"Who treads these quiet, sunlight paths shall come again

To find in them the peace of God, the joys of men."

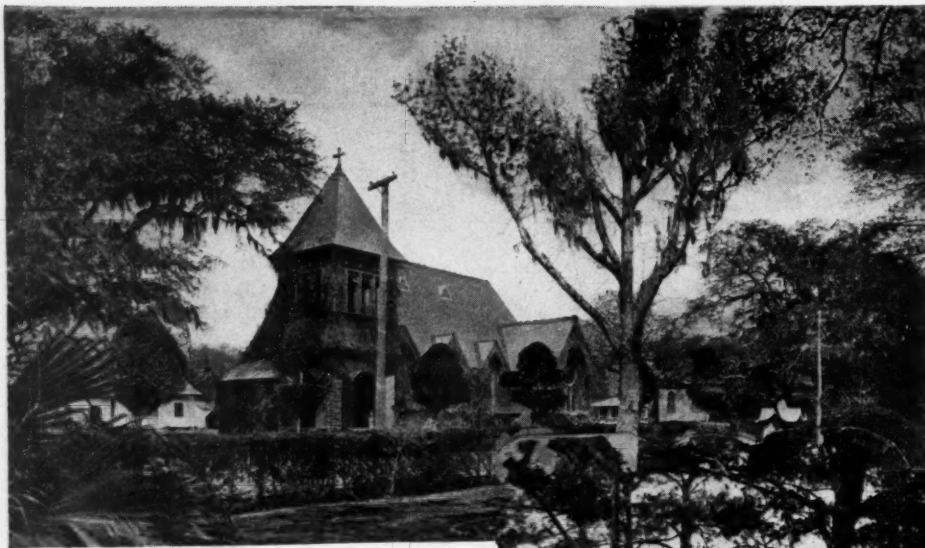
Gulfport

GOING back to parallels, mentioned at the beginning of this story, we find a fitting comparison in the foundation of Rome for that of Gulfport. According to the old Roman myth, if Romulus had not encountered the opposition of his brother, Remus, when he attempted to build the first rudimentary walls of Rome, that great city never would have been built. Remus had not the imagination of his brother Romulus, who saw a great city in the future, and he predicted failure and laughingly scorned at his brother for an attempt to build a city in such a locality. In anger, Romulus slew his brother, thus overcoming the opposition and thereby making possible the building of Rome.

In many respects the building of Gulfport is analogous to the story of Romulus and Remus. Gulfport was to be a seaport



In the oval above is a giant grapevine entwined about a sturdy oak. This spot is contiguous to the layout for the plaza of the Mississippi Centennial next December. At the left is one of the shore drives in the American Riviera and at the right the home of John M. Parker, recent vice-presidential candidate of the Progressive party



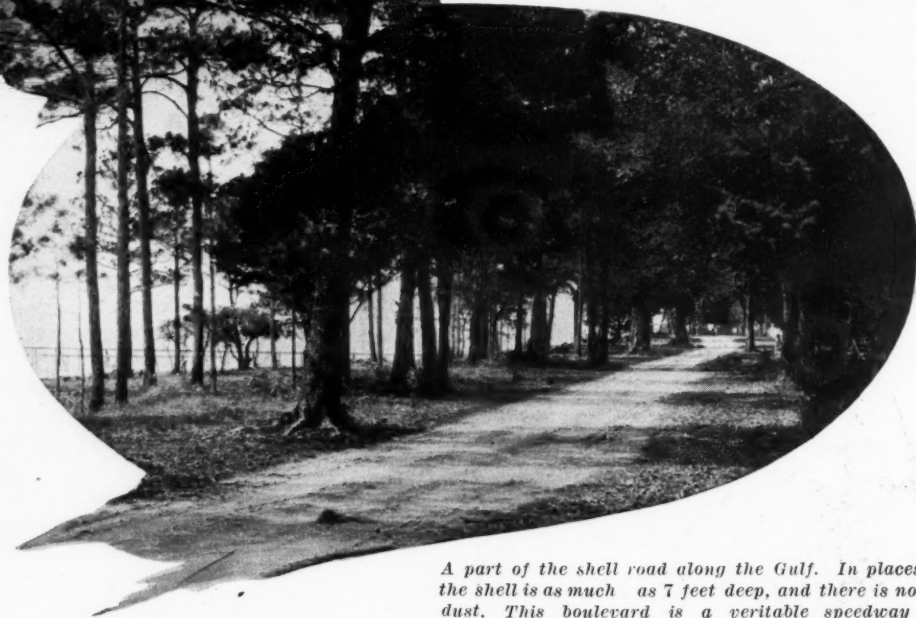
This view is typical of the landscape gardener's efforts at beautification of streets and grounds in Biloxi. On every hand are sub-tropical plants and shrubs

and the United States engineers reported that it was an unfavorable place for a deep port, because deep ports should be located on bays or at the mouths of rivers. However, there were men of the Romulus type about, who could get a more favorable glimpse of the future. The opposition was unheeded and the work of building Gulfport was pushed forward.

Wise City Planning

The layout of Gulfport shows forethought in wise city planning. Wide streets, planted with palms and other sub-tropical plants, have a beauty and appeal that is second to none in the South.

There came a time when the plans for a great seaport and railroad terminal came to a standstill, but certain individuals took up the work and succeeded in the venture. Now ships of the seven seas find their way into Gulfport harbor, taking cargoes of longleaf yellow pine, the finest of building material, to all parts of the globe. From the opening of the port in



A part of the shell road along the Gulf. In places the shell is as much as 7 feet deep, and there is no dust. This boulevard is a veritable speedway

1902 may be dated the actual growth of the city. From that time on the growth of the city reads like a tale from the Arabian Nights. So great is the influence of the city to-day that it gained for itself the site for the Mississippi Centennial, which will open next December.

The Mississippi Centennial exposition will be expressive alike of pride which Mississippi feels in having been for a full 100 years a sovereign state, and of a record of achievements which it has inscribed on the scroll of time. President Wilson has said, with reference to the coming centennial: "The people of Mississippi have the gratification of looking back upon a long and honorable history, touched with great distinction." The exposition will not be a Mississippi affair altogether. Other states will participate as will several foreign coun-

tries. The exposition grounds join the Gulf and a view of the plans by the writer on a recent visit gives promise of a setting which will make the centennial stand out in the memories of those who see it long after the final curtain shall have been drawn.

Biloxi

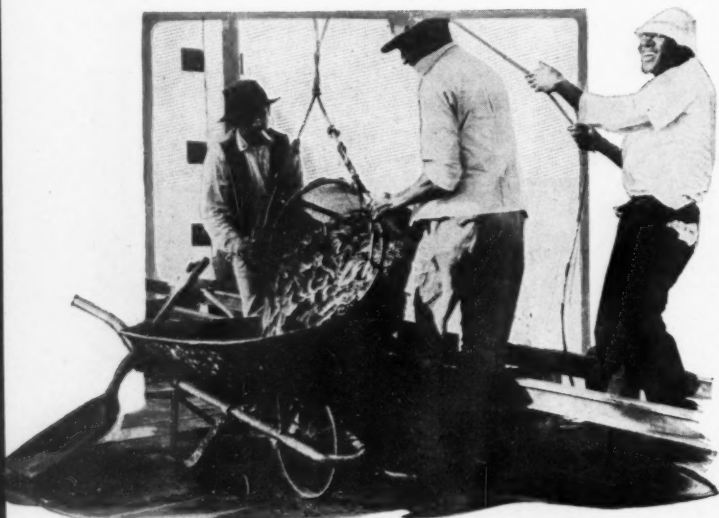
QUITE naturally you say, "What a queer name." True enough, it is peculiar, but does it not sound musical and suggestive of pleasure? It is an Indian name, the meaning of which seems somewhat in doubt. Good authority holds that it means "a people between two waters."

tion as a student of Indian languages claims that it is a combination of two names and means "first people." Be the meaning what it may, the fact remains that Biloxi is the name of a tribe of Indians inhabiting this territory at the time the first settlement was made by the whites, under d'Iberville in 1699. Here you will find evidences of that old settlement; the narrow streets and quaint old houses. You will also find the more modern things.

Biloxi Once Louisiana Capital

Biloxi was the first capital of the province of Louisiana, and as such, claimed the distinction of being one of the gayest places outside of France. Cavaliers with waving plumes and dangling swords yielded to the graces of fair and attractive maidens and knighthood was in flower, dancing and other social gallantries being indulged in freely.

But the Biloxi of to-day is not the Biloxi of yesterday. A large percentage of the population of Biloxi is necessarily of the sea-going sort, for it is from the waters of the Mississippi sound and of the Gulf of Mexico that Biloxi derives the industries which constitute the greater part of its commercial life.



Some of these may be in your salad today. The shrimps are brought up from the bottom of the boat in buckets and loaded in wheelbarrows, which take them into the canning factory

Should one go to the waterfront of Biloxi in the early gray dawn before the mists are lifted, he will see shadowy, ghost-like shapes creeping out past Biloxi light and the outer edges of Deer island, hoisting ghostly sails and stealing away into the quiet of the early morn, like so many specters. These are the fishing fleets. Many of these vessels and schooners are owned and maintained by large companies for the special purpose of capturing the finny denizens of the deep, scuttling the luscious bivalves, or oysters, and making immense seine hauls of shrimp, which delicious crustacean is found only in the waters of Mississippi sound of a sufficient size to make them of merchantable value, hence the country's supply of this delicious salad requisite comes from this immediate vicinity.

Activities of Late Afternoon

Come back to this section in the late afternoon. You will find schooners, luggers and fishing smacks of all descriptions tied up at the wharves. You will hear a jargon of languages, in which tongues babble ceaselessly, prate of the weather conditions, the catches of the day, the prices ruling the market and the net returns of the day's work. You will find large trucks

brought from the boats in wheelbarrows as shown in one of the illustrations. The shrimps are deposited in a long trough on each side of which women and girls pick up the none too attractive crustacean, break off the head, turn him upside down and he falls out of the shell. Perhaps I might as easily have said she, but the distinction is superfluous. When a two-quart pail has been filled the pail is taken to a wicket, or window, passed through to an attendant, who weighs the contents of the pail and turns back any surplus over the fixed weight together with a nickel. Thus, the shrimpers are paid on the spot. But to get back to the hygiene. I saw the infants of some of the Austrian workers lying in a row between two such troughs as I de-



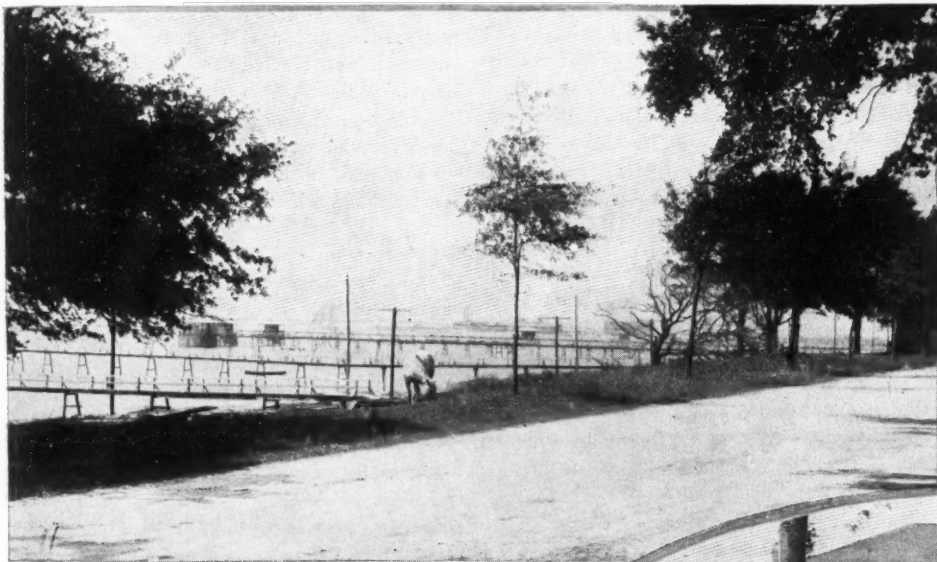
Biloxi, like Boston, has its Back Bay. The etymologist has found Biloxi to mean "people between two waters," and the stretch of water lying back of the town, here shown, seems to bear out the authenticity of the definition, the Gulf being in front of the town

scribed, many of them, and they seemed as comfortable as if in a basinette in a well-regulated nursery.

In the early and the late afternoon you will find bath-houses, which on account of the tides prevalent, are built out from the shore for a hundred yards or more, filled with bathers. It is the period of the day that the visitor to Biloxi takes advantage of the magnificent bathing facilities of Mississippi sound. Delightfully cool in summer and of an even temperature in winter, when the temperature of the water seldom reaches as low a degree as that at Atlantic City when it is at its warmest, bathing is popular the year around.

Biloxi in Full Bloom

No more beautiful sight can be imagined than Biloxi in the full bloom of a summer day, the magnolia trees showering down the petals of their white, sweet-scented flowers, the live oaks festooned with long, sweeping sprays of wavy Spanish moss and the laughter of contented and happy people bathing, boating and fishing in its



Pass Christian has its canning factories and its bath houses built far out from the water's edge. This is done on account of the tide

loaded with baskets being shoved to the schooners, there filled to the brim with fish, oysters, shrimps or crabs, as the case may be, rushed into the large factories and made to undergo the operations necessary for their preservation and canning.

One might expect the help employed in the factories to be negroes, since Biloxi is a southern city, but I am told that the workers in the canning factories are largely Austrians. Champions of infant hygiene will find food for thought if they visit the shrimp factories as I did and see the same things I saw. Here the shrimps are



Beauvoir, one-time home of Jefferson Davis, president of the Confederacy, but now used as a part of the Confederate soldiers' home at Biloxi, Miss.

immediate confines. On regatta day, when the waters of the sound are actually alive with hundreds of schooners, sloops, yachts and the smaller cat boats, to say nothing of the motor boats, no more magnificent spectacle could be conceived.

Beauvoir, once the home of Jefferson Davis, president of the Confederacy, is in the outskirts of Biloxi and is now the Confederate soldiers' home. The house was originally the property of James Brown, a wealthy planter, but after Davis was released from prison in 1876 and had returned from Europe and Canada, Mrs. Sarah Dorsey, who bought the property after the war, invited Davis to occupy Beauvoir. Mr. Davis had expressed a determination to write a book on the rise and fall of the Confederacy and it was believed the Gulf coast would prove a favorable spot for this work. Mrs. Dorsey, knowing that Davis' fortunes had been wrecked by the war, elected to give Davis the property, but he refused. In disposing of the property to the state a stipulation was made that the home was to be maintained as a refuge for indigent ex-Confederate soldiers, sailors, their wives, widows, orphans and servants.

The vaunted spas of the old world hold no more delightful elixirs than those that come from the sunshine, the soft ocean breezes, the land, the dew and rain on the shell-dotted shores of America's Riviera. A southern lyric writer sings:

"In thy jasmine-bordered gardens what spell of memory lies
When the mocking' birds are singing of love and paradise."

LIMOUSINES HAUL COAL

Los Angeles, Cal., Jan. 13—When the recent unprecedented cold wave struck southern California, blanketed motor cars were seen on the streets for the first time in history. It was not necessary to cloak the radiators, when the cars were in operation, but it was a wise precaution to cover them when left standing at the curb or parked on lots during the early morning and evening hours. For the first time known, thousands of cars were discovered to have ice flakes in the water in the radiators after an unusually cold night. The morning scene of the professional man pouring hot water out of a tea kettle into the radiator of his car after trying vainly to start it when it came time for him to leave for the office became commonplace.

The remarkable experience of driving a motor car to the coal dealer's place and returning to a fashionable residence with a load of fuel was enjoyed by many. The demand for coal and briquets was so great, dealers could not make a delivery, or, if they did, charged a bonus for doing so. A limousine was seen in a coal yard and the chauffeur was engaged busily in piling sacked briquets into it. The seat cushions had been removed and the upholstery covered with canvas to protect the interior.

Civil War in California

Motor Vehicle Dealers Take Up Challenge of State Official; Pyrotechnics Probable

Failure to Report Sales Causes Department to Deny License

LOS ANGELES, Cal., Jan. 13—Open war is on between the motor vehicle dealers of California and H. A. French, superintendent of the State Motor Vehicle department. The gauntlet has been thrown down by French and accepted by the dealers individually and collectively, through their organizations. The influence of the dealers and the power of affiliated motorizing interests is tremendous in California and inasmuch as French's job is of a political nature, there promises to be sensational developments.

Dealers in this state are supposed to report every sale they make to the motor vehicle department. This necessitates the preparation of a number of reports and submitting them to the capital. The dealers held there was no legitimate reason to exact such a requirement from them and many refused, or neglected, to file reports during 1916. They claimed collecting such data was within the province of the state, but it could not be required of them.

Throughout 1916, the dealers proceeded in their own chosen way. The day of reckoning came, though, Jan. 1, 1917. Dealers had to apply for new licenses. By the payment of \$25 they had been issued number plates for use on five cars. Additional plates could be obtained for \$2 per set. The same numbers were to be valid for 1917. Some dealers had twenty or more sets of plates in use. They reapplied for licenses. Evidently French gave orders to look up the records. His time had come. Dealers

who had not complied with his ruling in 1916 were refused new licenses. Those, who had complied and wanted more than five sets of plates, in some instances, were told their business did not warrant more and they were denied them. Earl C. Anthony, a state distributor, asked for twenty-one licenses. He was allowed only twenty. Now Anthony has entered suit against French and other dealers have rallied to his support. Those who are black-listed because of failure to file reports last year are having to pay the same license fee exacted of individual owners, which is 40 cents per horsepower.

VOORHIS GOES TO NASH

Pontiac, Mich., Jan. 13 — Charles B. Voorhis, who has been general sales manager for the Oakland Motor Car Co., has resigned to go with the Nash Motors Co., Kenosha, Wis. Thomas H. McDearmond, assistant sales manager for the Oakland company, is now with the George P. Miller Co., Madison, Wis., Oakland dealer.

M. & A. M. ELECTS OFFICERS

New York, Jan. 12—At a meeting of the board of directors of the Motor and Accessory Manufacturers held at the New York headquarters, C. W. Stiger, of the Stromberg Motor Devices Co., Chicago, was re-elected president to serve one year. Other officials elected are: First vice-president, Charles E. Thompson, president of the Steel Products Co., Cleveland; second vice-president, E. H. Broadwell, vice-president of the Fisk Rubber Co., Chicopee Falls, Mass.; third vice-president, T. J. Wetzel, of the Precision Die Casting Co., Syracuse, N. Y.; treasurer, L. M. Wainwright, president of the Diamond Chain and Mfg. Co., Indianapolis; secretary and assistant treasurer, Alfred P. Sloan, Jr., president of the United Motors Corp., New York.

SCHOOL WAR TRUCK DRIVER!

San Francisco, Cal., Jan. 13—Before the truck and the motor car can be expected to render efficient service in the field with the United States Army, it will be necessary to train drivers and make experts out of enlisted men just as experts are developed in other service schools for other branches of the military rank and file.

An officer high in the quartermaster's department of the regular army is responsible for the above statement. This officer, who has just returned from the Mexican border where he made an exhaustive study of the motor car and truck in the service, claims that the trucks and cars are not showing up as well as the officers and manufacturers would like to see them.

He says that he has seen many unfavorable reports that have been sent in on trucks and motor cars and that many officers are really opposed to motorized equipment, but that it is not the fault of the construction of these cars and trucks, but the fault of the drivers. It seems that



J. Walter Drake, president of the Hupp Motor Car Corp., greeting capital-to-capital Hupp on its arrival in New York last week

many of the drivers, both civilian employees of the quartermaster's department and enlisted men, are victims of the speed germ. They start out from Columbus or some other border town for a post located some distance away and try to break all existing records. As a result another truck will have to be sent out to pull the first one out and then mules have to be sent out to pull both trucks out, delivering the supplies.

REEKE BECOMES NASH DISTRIBUTOR

Detroit, Jan. 15—Al Reeke, general sales manager for the Nash Motors Co., will resign that position to become a distributor for the company. His successor has not been announced.

MASTEN OAKLAND SALES MANAGER

New York, Jan. 15—W. H. Masten has succeeded Charles B. Voorhis as sales manager of the Oakland Motor Car Co. of Michigan, Pontiac. This announcement was made by F. W. Warner, president and general manager of the company, at a dinner given by him to Mr. Masten, Mr. Voorhis and a number of Oakland officials and distributors at the Hotel Manhattan, Jan. 11.

ADVERTISERS MAY INVESTIGATE

New York, Jan. 13—The project of having the headquarters office of the Association of National Advertisers investigate motor trade publications was discussed at a meeting of the car and accessories division of the society held at the New York Advertising Club Jan. 10. Reports on the value of various advertising methods were presented.

U. S. RUBBER FLOATS BONDS

New York, Jan. 13—Plans covering the purchase of \$60,000,000, first and refunding mortgage, 5 per cent bonds of the United States Rubber Co., to cover all existing bonds and liens on the property of the company have been consummated. Kuhn, Loeb & Co. have begun the formation of a syndicate to underwrite the issue and will be associated with the American International Corp. Part of the proceeds from the sale of the bonds will be used to retire outstanding obligations of the parent company and its subsidiaries, amounting to \$24,697,148. All existing obligations will be paid on or before Dec. 1, 1918, except \$2,600,000, 6 per cent gold bonds of the Canadian Consolidated Rubber Co., maturing in 1946, and \$9,000,000 debentures of the General Rubber Co., due Dec. 1, 1918. The latter will be left undisturbed for the present as plans are under consideration for dealing with the company's crude rubber interests in another way. Last year's sales of the company and its branches approximated \$125,000,000 and the net earnings for 1916 are estimated at \$12,500,000, both of these figures being new high records.

Milwaukee Show Attracts

Attendance Is Nearly 70 Per Cent Greater Than That of Last Year—Total 70,259

Demand for Space Increasing So That Problem Is Presented

MILWAUKEE, Wis., Jan. 12—The official attendance at the ninth annual Milwaukee motor show, which was held in the Auditorium from Jan. 5 to 11, inclusive, was 70,259, compared with 41,440 in 1916, a gain of 28,819, or nearly 70 per cent. Paid admissions also increased to a remarkable extent and were nearly one-half of the total attendance.

The tenth annual show will be held somewhat later in January, 1918, than this year, to avoid conflict with the New York exposition. In past years the Milwaukee show dates have come immediately following New York, but this year Milwaukee opened on the day before the Grand Central Palace affair. Thus it is believed that the usual attendance of big men in the industry at the Milwaukee show was cut down by the conflict. While all of the factories, as usual, sent special show cars and cut-out chassis to this city, it is likely that more of these jobs would have come had this show followed New York.

All exhibitors declare the show to have been unusually successful in all ways. The great demand for exhibit space made it necessary to crowd passenger cars into the basement, regarded as the exclusive property of motor truck exhibitors. Practically the final limit of elasticity of the big auditorium was reached this year and a problem of accommodating the overflow at future shows if space demands continue to

grow as in the last few years, now has become a serious one.

But little inconvenience was noted from the acute congestion of railroad traffic. It is known that the railroads issued orders some time ago that show cars and chassis practically must be considered perishable goods and be given the right of way.

The largest truck exhibited at the show was a 7-ton Stegeman, with worm drive, which featured the display of the Stegeman Motor Truck Co., Milwaukee. The car, complete with body, as exhibited, weighed 13,122 lb. The rear tires had a combined width of 32 in.

From information gathered at the show, Wisconsin distributors expect to place an aggregate of 38,500 to 40,000 cars in the Badger state for 1917. During 1916, this state absorbed 35,860 cars, an increase of 44 per cent over 1915. The total number registered by private owners was 115,650. The number sold in Wisconsin last year was more than all of the cars in use in this state in 1913, which was 34,646.

It is estimated that 75 per cent of the total number of 1917 dealers in Wisconsin attended the show. This year the Milwaukee Automobile Dealers, Inc., which manages the show, dispensed with the annual banquet in honor of state dealers because no suitable banquet hall could be found to accommodate the large crowd, and also because practically every factory and distributor entertained its dealers at banquets during show week.

MULFORD LEAVES HUDSON

New York, Jan. 16—Special telegram—Ralph Mulford has left Hudson to join a Cleveland car company with which he is at present negotiating.

BROADEN RECEIVERS' AUTHORITY

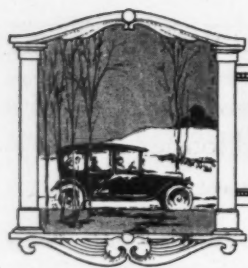
York, Pa., Jan. 12—Judge Charles B. Witmer in the United States district court at Williamsport yesterday appointed William A. Keyworth, Carlton L. Hoff and Henry D. Schmidt, all of York, Pa., receivers for the Pullman Motor Car Co., of York. The same men were recently appointed receivers of the company by Judge Nevin M. Wanner, in York, but that action only covered the assets of the company in York county, whereas the receivership resulting from yesterday's action protects the assets in all parts of the United States. The company has assets in twenty-six states. All the company's real estate and manufacturing property are located in York.

The extension of the receivership results from a suit presented in the United States court by Michael S. Niles, solicitor, in which the Ryland & Brooks Lumber Co., Baltimore, Md.; the Dupont Fabrikoid Co., Wilmington, Del.; and G. Laton Grier, of Delaware, and N. B. Marple, Columbus, O., are plaintiffs. The receivers are authorized to borrow not more than \$120,000 for the conduct of the company's business.

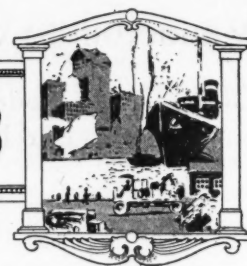
Ford Makes Big Purchase

Material for Million Cars Said to Have Been Bought from U. S. Steel

CHICAGO, Jan. 16—It is understood on high authority that the Ford Motor Co. yesterday bought direct from the United States Steel Corp., material for one million cars for this year's production, 250,000 more than the 1916 figure. Although the schedule of deliveries will not be completed until later in the week, it is understood that deliveries on the order will begin immediately. This includes stock for every metal portion of the car except some parts of the motor, and will be delivered in the form of sheet rod and bar stock. As no additional proportion of copper wire or magnet stock is ordered, it is taken for granted that Ford does not at this time expect to incorporate electric starting as part of the new production.



EDITORIAL PERSPECTIVES



The Brimming Pocketbook

PROSPERITY, that new abstract institution which is creeping into every corner of the United States, is setting up a pronounced reflex action in the concerns most recently created for motor car manufacture. This reflex action is exemplified in the return of builders to cars of extreme high price.

THE Chicago show will exhibit to the public for the first time a chassis alone costing \$9,500. It will exhibit a good round number of new cars, built by new companies, which list around \$3,000 to \$5,000. It will exhibit the last notch in the coach builder's art in new and wonderful bodies applied to stock chassis of old established car builders.

TWO years ago—a year ago, cars in the \$5,000 class were few and far between. Now there are a score and more of them. Moreover the high-priced ones are not all inclosed bodies, in fact,

the proportionate price of high class closed cars and high class open cars, as far as the number of models is concerned is about maintaining an equilibrium.

IT is the demand for individuality and real art in body designing and finish that is stepping the price up, and where there is a public cry for an expensive article it does not take long for manufacturers to create articles which will appease that particular demand.

THERE is no good reason why the demand for high-priced and special-built cars should not be maintained. It was the prophecy several years ago that the industry would eventually revert almost entirely to the production of cars around the \$500 class. The new demand blasts that prophecy. Now the tendency seems to be toward ever-increasing price.

Safety at Crossing

MOTORISTS who cross railroad grade crossings, without heeding the warning to "Stop, Look and Listen," then if reasonably sure no train is about to pass, cross the track without shifting to low gear and with an abundant supply of gasoline vapor feeding the engine—are making a death trap for themselves and for others in the car. How much time is lost in taking the precaution to "Stop, Look and Listen"? A fraction of a minute.

WITH the motor working in low gear and a good supply of gasoline feeding the cylinders, there is no chance inadvertently to kill the engine or stop the car on the track. Many railroad crossings are much above the elevation of the highways and the running slowly in high gear to ease over the bumps together with the

added pull of the grade puts an unusual load on the engine at nearly closed throttle, and the result is a dead engine. This trouble can be overcome as suggested: low gear and plenty of gas feed.

THE slogan to be used by every motorist in crossing a railroad track at grade should be "Take No Chances." It is bad enough to risk your own life. It is nothing less than a crime to jeopardize the lives of others in your car. Railroads are taking every precaution to prevent grade-crossing accidents. Why is it that men of strong minds and intelligence in other walks of life will deliberately flirt with death when driving a motor car over railroad crossings?

Startling the Natives

THOSE who visited the motor car exhibition in New York and those who read representative accounts of the exhibition cannot fail to be impressed with the absence of startling features. In other years we have had such new developments as the eight-cylinder engine one year, the twelve-cylinder another, and so on. This year there is nothing really novel offered by representative manufacturers. Of course, the introduction of the sixteen-valve motor as a part of the stock production program of three manufacturers may be considered a development, although we have had the sixteen-valve, four-cylinder motor in racing for years. It is more probably an example of the incorporation of the lessons learned in racing as a part of stock production.

PERHAPS, at first glance, this lack of high lights may be considered an evidence of lack of progress. Such is not the case, however. It means on the other hand that with the major portion of the design a matter of settled policy for the time being, at least, the manufacturers have found it possible to turn their attention more completely to the refinements of manufacture and practicalities of construction instead of finding it necessary to devote a major portion of their energies to the development and exploitation of designs or systems hitherto foreign to their production program.

THE industry now is on a big-production basis which must of necessity check the introduction of anything radical in the way of design or construction. For the large manufacturer to change his product in some important feature will necessitate excessive production costs. Consequently large production manufacturers must be certain that any change will result in great advantages before it is made. This is the reason that we must look to the small manufacturer in general for any sweeping alterations or radical deviations from previous design. The manufacturers who are making their first appearance before the public are the most likely to have something out of the ordinary to offer the buying public.

THE fact that there is considerable uniformity among the large manufacturers as to design and also that there is little radical introduced may be taken to mean that for a time, at least, the period of experimentation insofar as it is to be tried out on the ultimate consumer, is over. The fact that the manufacturer is not offering anything new mechanically does not mean that the experimental and design departments of the factory are idle. Every factory of any prominence maintains an advance line of skirmishers in the fields of research, but they are slower than ever before in offering their findings for public consumption.

Vanderbilt to Come East

Effort Being Made to Transfer Classic Back to Long Island Road Course

Co-operation Looked for in Accomplishing Proposed Change

NEW YORK, Jan. 16—Special telegram—The Vanderbilt cup race may be given back to the East. A committee has been appointed to consider ways and means of bringing this about and if it can be satisfactorily arranged, the race may again be run over a Long Island course. The matter first came up for discussion at a luncheon tendered to Dr. H. M. Rowe, president of the American Automobile Association, by Robert Lee Morrell, president of the metropolitan consulate of the A. A. A. Later a committee was appointed to consider the possibility of bringing the race East and to make individual investigations concerning conditions which have made it necessary that the race be held on the Pacific coast.

The committee consists of Robert Lee Morrell, Jefferson Demont Thompson and William Schimpf, all ex-chairmen of the contest board, Richard Kennerdell, present chairman, Frank G. Webb and Robert Graves. To date little progress has been made though it is confidently expected that with the active co-operation of dealers and factories something of a definite nature may be done in the near future. The committee is to meet again in the course of a week or ten days.

MOVIES SELL MOTOR CARS

New York, Jan. 15—Motion pictures as a means of advertising is rapidly assuming major proportions in the motor car industry. In the three years that this class of film has been produced, more than 90,000,000 feet have been flashed on the screens of 25,000 theaters scattered over the United States and to-day over 10 per cent of the output of this film is sold direct to motor car dealers, garagemen, repairmen and accessory dealers. The tire and accessory dealers are the largest consumers and the garagemen next. The animated cartoon film is by far the most popular. These average from 20 to 50 feet in length and cost about \$7.

ROAD EXPENDITURES INCREASE

Washington, D. C., Jan. 15—Expenditures for road improvements in the New England states in the last decade range from 10 per cent in Rhode Island to nearly 205 per cent in Massachusetts according to statistics for that section just published by the office of public roads and rural engineering of the department of agriculture.

The surfaced roads of the six states have an aggregate mileage of 18,036 miles which is 20.8 per cent of the total road mileage. The report showed that 10 per cent of the improved roads in New England are bituminous and macadam, 12 per cent macadam, 23 per cent concrete and .01 per cent brick. Approximately 60 per cent of the improved highway is surfaced with gravel and of the six states, Massachusetts has 45.53 per cent of the total surfaced roads.

U. S. NEEDS NO LICENSES

Washington, D. C., Jan. 16—Special telegram—Comptroller of the Treasury, Walter W. Warwick, has ruled that the Federal Government has the right to operate motor cars anywhere in the country without obtaining licenses for its chauffeurs and without buying licenses for the cars. This will be particularly broad in effect, since the truck is becoming so nearly universal in use for the mail service.

PENNSYLVANIA TAGS REJECTED

York, Pa., Jan. 13—With the state highway department insisting that the license tags furnished by the prison labor commission are below standard in construction and rejecting the first shipment of 8,000, applications for tags that cannot be filled are piling up with the probability that within a week the state may be 25,000 tags behind the demand. Private interests that have hitherto been interested in tag contracts from the time the prison labor commission got the contract, have been active in their endeavors to discredit the plan of turning out the tags with convict labor. The prison labor commission is supplying the tags for 20 cents per set, or about one-half the price asked by the private contractors.

ILLUSTRATION OF OLDSMOBILE

In the MOTOR AGE issue of Dec. 28, the article descriptive of the Oldsmobile eight for 1917 contained an illustration of the four passenger club roadster which was incorrectly captioned as a seven-passenger car.

AERONAUTIC EXPOSITION FEB. 8-15

New York, Jan. 15—United States government will have a comprehensive exhibit at the first Pan-American Aeronautic Expedition to be held in the Grand Central Palace, Feb. 8 to 15. Among the departments to be represented is the War Department, the aviation section of the army, the U. S. navy, Bureau of Standards, the Weather Bureau and the U. S. Geodetic survey. In the government exhibits will be shown various methods now employed on the European war fronts for intercommunication of aircraft. The navy department will show various instruments required for hydro-aeroplane navigation by naval flyers of this kind.

Fiats to Race This Year

Two Italian-Made Cars Will Be Piloted Over Hoosier Course Memorial Day

Details Not Available but High Speed Is Expected

PARIS, Jan. 14—Special cable—The decision of the Fiat Co. of Turin, Italy, to enter two Fiat racing cars at the Indianapolis speedway Decoration Day, May 30, may be taken as conclusive evidence that the European countries have not lost interest in the motor industry of America and that they are anxious to maintain their former prestige in this country. That Fiat has been developing new racing cars has been known for some time. These have been under test for the last year, and they have been given severe treatment during that time, as the Fiat pursues a uniform policy of severe testing. Opinion here is that other concerns are much interested in the American speedway racing circuit but that war conditions have made it impossible for them to build special cars. The details of the new Fiats are not yet available.

DISBROW HAS NEW CARS

New York, Jan. 13—Louis Disbrow is making a display in this city of two new racing cars built by him and which he will use on the tracks this year. Two T-head Wisconsin motors of 60 and 90 hp., respectively, are used.

HEARN IS REINSTATED

New York, Jan. 15—Eddie Hearn was reinstated by the contest board of the American Automobile Association at its meeting last Wednesday. His reinstatement becomes effective July 12 providing he does not compete in any outlaw races up to that time. Hearn will drive two cars this year.

HOME FACTORY TAKES U. S. FIAT

Paris, France, Jan. 14—Special cable—The Fiat Co., Poughkeepsie, N. Y., has been taken over by the home factory of the Fiat Co., Turin, Italy, according to information obtained in Italy a few days ago. The details of the deal are not disclosed but it is understood that some of the heaviest stockholders in the U. S. A. Fiat factory retain their interest. J. S. Josephs, treasurer, retains his interest.

CONTINENTAL SERVICE STATIONS

Detroit, Jan. 15—The Continental Motors Co. will open a number of national service stations throughout the United States. Contracts have been closed in both New York and California for the first of these stations. The identity of the parties concerned has not yet been made public.

Natural Results



Annual banquet of the Motor and Accessory Manufacturers at the Waldorf-Astoria, New York, Jan. 10.

Gotham Show Is Productive of Many Startling Announcements—Highlights Told in Brief

NEW YORK, Jan. 15—New York's greatest motor car show came to an end here Saturday night after breaking all records in attendance, retail business transacted, dealers' contracts signed and general public enthusiasm in the history of the industry. It is estimated by the N. A. C. C. officials that the attendance was 15 per cent, or more, greater than at last year's show. The same authority is responsible for the statement that more dealers attended the show than ever before, although it has not yet been possible to complete a count. Practically every exhibitor reported increased sales as compared with the show of 1916 and all were tremendously enthusiastic over the great increase in popular interest and general readiness to purchase cars.

The show enabled many dealers to close sales that had been under negotiation for some time and furnished all of them with long lists of prospects which will keep them busy for many weeks to come. That the show was the greatest ever held is everywhere evident. Unofficial estimates of the attendance ranged from 300,000 to 500,000, but of course this is merely a matter of conjecture. The N. A. C. C. reports that the new method of handling dealers is much more successful than that formerly employed and the dealers were better satisfied.

The national motor car exhibition always

is productive of announcements and rumors of new connections in the industry and new selling and manufacturing arrangements. One of the announcements this year concerns what is said to be the biggest motor truck contract ever entered into this country outside of a war contract and also offers the additional feature that an entire circus is to be transported from point to point by motor truck instead of by railway train. This contract was made public at the office of President Frank P. Spellman of the United States Circus Corp. It was announced that the circus had contracted for one hundred 3½-ton motor trucks from the Kelly-Springfield Motor Truck Co., Springfield, Ohio. The transaction involves nearly \$400,000, and will form the nucleus for a motor train circus which travels from city to city by motor vehicles.

* * *

Hartford shock absorbers have appeared in new form, this incorporating an improved connecting feature and a few of the former users of the old type which are incorporating the new type as stock equipment are: Pierce-Arrow, Marmon, Stutz and Pathfinder.

* * *

Representatives of a new Western concern, the Fageol Motors Co., Oakland, Cal., announces the production of a motor truck and an exceedingly high-grade speedster

and touring chassis. The chassis is to sell at \$11,000. Lewis Bill, formerly of Jeffery, is identified with the company. One chassis is now in Chicago being fitted with a speedster body by the Kimball company for the Chicago show.

* * *

One of the features of body equipment which caused comment was the large number of inclosed cars in which heaters were fitted. Both Perfection and Craftsman heaters were much in evidence.

* * *

In addition to showing its full line of chassis and special bodies at the Palace, the Peerless Motor Car Co. had special exhibits at the Waldorf and Majestic hotels.

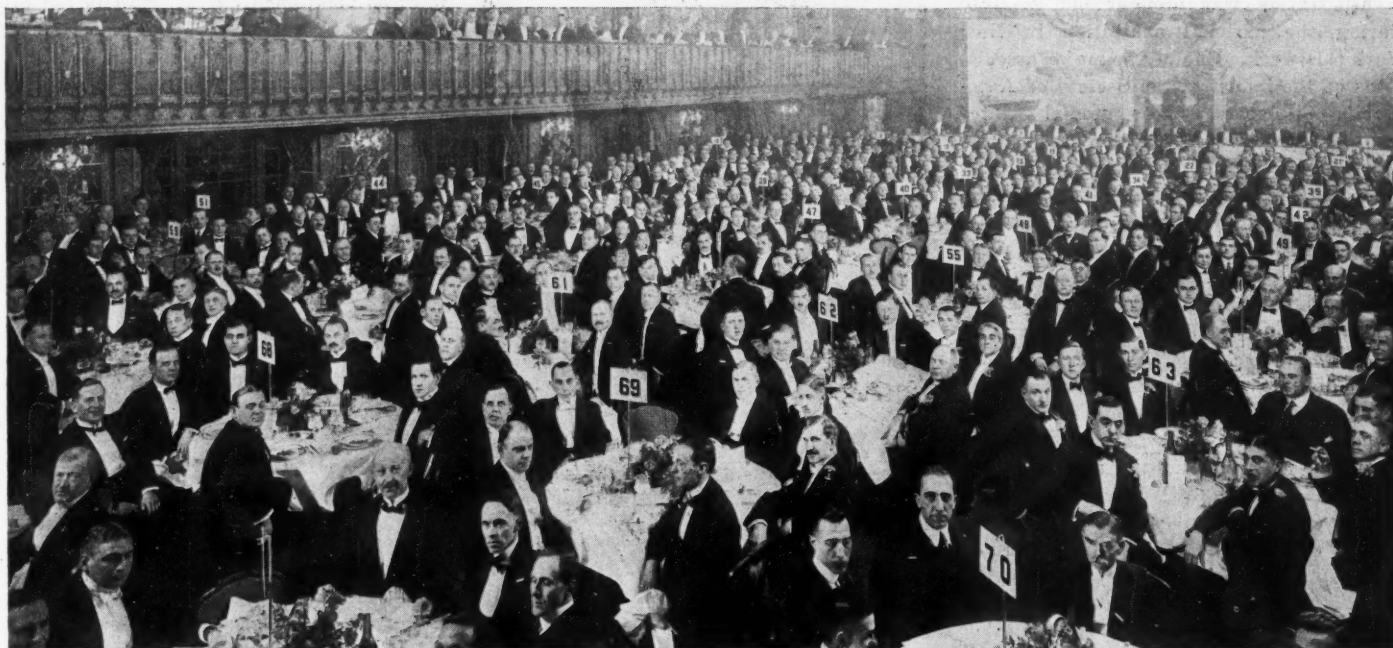
* * *

That munitions contracts cannot be expected to be a permanent source of business as they have been for the past two years, has caused munition manufacturers and builders of munition machinery to consider other lines in which to utilize their vastly increased manufacturing resources and some of them are turning to the motor car industry. One of the large manufacturers of munition machinery and perhaps the largest manufacturer of machines for producing large shells is turning its plant partially to the building of motors. This is the Amalgamated Machine Corp., Chicago, which according to G. B. Burrage,

(Concluded on page 21)



Seventeenth annual banquet of the Rubber Club of America at the Waldorf-Astoria, New York, Jan. 8



Members of the Society of Automobile Engineers at their annual banquet during show week in Gotham



Members and guests of the National Automobile Chamber of Commerce at New York banquet

And We Talk Economy!

\$1 Worth of Fuel Gives 10c Worth of Power in Our Engines

Men Who Delve Into Vitals of Car Discuss Their Findings in Annual Convention—Engineers Elect Dunham President and Adopt New Standards of Motor Car Parts Sizes

NEW YORK, Jan. 12—The broadened scope of the motor car industry and its inter-relation with other forms of power transportation was brought out forcibly during the national exhibition in New York this week. One of the major associations of the industry, the Society of Automobile Engineers, whose annual winter meetings are one of the features of the week in New York, brought its general convention to a close yesterday. This is the last meeting of the Society of Automobile Engineers that ever will be held, for by the time of the next session in mid-summer, it will be a new and broadened association with a new and broader name.

In compliance with the request of the Army and Navy departments of the Government, the motor car engineers have allied themselves with those of the aircraft, the tractor, and the motor marine fields, and the name will be changed to the Society of Automotive Engineers, whose field of endeavor is as broad as the art of self-propelled transportation through the air, on the water and on land. It only remains for the almost certain confirmation of a mail vote to put this into effect.

S. A. E. Day

Yesterday was S. A. E. day, and starting with the business meeting in the morning, a special session in the afternoon and ending with a banquet and entertainment in the evening, the whole day was devoted to the engineers and their friends.

George W. Dunham, consulting engineer was elected as president, to succeed Russell Huff, chief engineer of Dodge Bros.; Jesse G. Vincent, vice-president of the Packard company, was made first vice-president; Charles M. Manly, vice-president of the Manly Drive Co., becomes second vice-president; Herbert Chase, assistant manager of the Society is treasurer. New members of the council are: B. B. Bachmann, engineer of the Autocar Co., H. L. Horning, engineer and general manager of the Waukesha Motor Co.; C. W. McKinley, engineer of the Willys-Overland Co., and F. E. Moskovics, commercial manager of the Nordyke & Marmon Co. It is stated



George W. Dunham, new president Society of Automotive Engineers

that Horning received the greatest vote ever recorded for a member of the council.

After the close of the professional and business sessions the annual banquet was held at the Biltmore and the social activities culminated in an S. A. E. frolic at Ziegfeld's Follies at midnight.

In opening the professional and business meetings, President Huff spoke of the successful year which the society has just passed through and on the bright outlook for the future, particularly since the merging of the other automotive societies had been practically consummated. Members of the other organizations are to be permitted to enter the S. A. E. at any time after the date of ratification for a period of 3

months, without the payment of initiation fees.

Another great feature of the society's work as mentioned by Mr. Huff is the increased co-operation with the government. This is a phase of the work which has been growing rapidly and presages a closer connection between the endeavors of the society and those of governmental activities in similar directions. The particular work in which members of the society are assisting the government are the drawing up of standard truck specifications and on the aeronautical division of the standards committee. The society is also in close touch with the bureau of standards in Washington.

President Huff spoke of the increase in membership of the society which now has passed the 2000 mark. In January, 1916, there were 1783 members. The total for January, 1917, is 2120, without counting thirty-five additional applications which have just been accepted.

Standards Committee Business

Growth of the standards work is worthy of comment. It had its inception in 1910 and at that time a number of the members of the S. A. E. contributed out of their own pockets to guarantee the work. In 1916 the budget allowed \$7,500 for standards work and the actual cost was \$10,000 and in 1917 it is likely that the expenditures along this line will exceed \$14,000. The financial condition of the society is indicated from the fact that there is a total surplus on hand of \$30,490.

Some of the other business to come before the society at the business meeting which followed President Huff's address concerned constitutional amendments. The matter of the change of name, revision of the council to take in the aeronautic and tractor fields, succession of officers and a constitutional revision committee, were passed along for further consideration.

The divisions which presented reports were those dealing with aeronautic engines, electrical equipment, electric vehicles, engines and transmissions, iron and steel, miscellaneous parts and fittings, springs, tires and rims and trucks. Little

discussion developed on any of the reports except that on the tires and rims. The tire and rims division has had under consideration for the last few years a set of standard loads for solid truck tires. It has been of considerable difficulty to reconcile the different tire manufacturers to these loads and the table arrived at in the report was turned over to the truck standards division for review.

A little discussion developed on the report of the aeronautical engine division on the recommendation of the tapered shaft fitting for propellers. The report covered this feature and spark plugs. There also was a notation on direction of engine rotation.

This year the S. A. E. is trying the experiment of compressing meetings during show week into one day. The morning of Jan. 11 was given over to business and the afternoon to the discussion of papers. The papers are as follows:

Some Problems of Aeroplane Construction—Capt. V. E. Clark, U. S. A., Capt. T. F. Dodd and O. E. Strahlmann.

The Ultimate Type of Tractor Engine—H. L. Horning.

Dynamic Balancing of Rotating Parts—F. Hymans.

Remarks on Dynamics of the Automobile—N. W. Akimoff.

Some Essential Features of High Speed Engines—A. F. Milbreath.

Heat-Balance Tests of Automobile Engines—Prof. Walter T. Fishleigh and Walter E. Lay.

Aerial Navigation Over Water—Elmer A. Sperry.

Two Aeronautic Papers

The first paper is a very concise statement of the requirements of the army with respect to aeroplanes. It contains a great deal of valuable data. The authors do not hesitate to criticise the practice of the day, and their paper should be of very great value to any manufacturer about to embark upon the construction, either of aeroplanes or of aviation engines. The other aerial paper is devoted very largely to considering the advantages of the gyroscopic compass.

The paper on Dynamic Balancing of Rotating Parts by F. Hymans, is a lucid and an accurate explanation of the main problems of balance and includes descriptions of several types of balancing machine. The author contends that the Akimoff, which is the most recent balancing machine, has advantages not possessed by any other, principally because a test on the Akimoff machine gives more complete information regarding the condition of unbalance of the body on which a test is being conducted.

A most interesting feature of the Akimoff machine is that a body to be balanced can be tested actually mounted as it will finally be. That is to say, the balance of a crankshaft can be obtained while it runs in its own bearings in the crankcase.

Where Power Losses Go

Thermal Efficiency Subject of Fishleigh Paper

Horning Talks Tractor Engines and Akimoff, Suspension

THAT \$1 worth of gasoline gives 10 cents' worth of power, the engine and is accessories absorbing the other 90 cents' worth.

That water abstracts 40 per cent of the heat value of fuel burned, exhaust gas carries away 25 per cent more, and air in contact with the engine carries away 25 per cent more, leaving only 10 per cent of heat value of fuel as brake horsepower.

These are the rough average conclusions given by Professor Fishleigh's paper on a series of tests made to determine the "heat balance" in a six-cylinder engine. Of course, the low thermal efficiency of a motor car engine has always been well known, but the author's tests give much detailed information of value. They show the effect of speed and of throttle opening. The extracts following include the main points of the paper, but there is much additional matter, including complete accounts of each test run.

The fuel consumption per brake horsepower per hour at any speed was marked high at low horsepower output, and decreased steadily as maximum output at any speed was approached. Thermal efficiency correspondingly increased at any speed as the output increased. Under maximum output conditions, the infrequent and unimportant automobile operating range, fuel consumption is relatively low and thermal efficiency relatively high. For a given brake horsepower developed, the fuel consumed per brake horsepower per hour increases at increased speed, the consumption for 20 hp., for example, being 0.67 lb. per b.hp. per hour at 640 r.p.m., 0.93 lb. at 1000 r.p.m. and 1.05 lb. at 1350 r.p.m.

Mechanical efficiency at any speed improves with increased load. For a given load, mechanical efficiency is better at low speeds, the figure for 20 hp. being 85 per cent at 640 r.p.m., 72 at 1000 r.p.m. and 62 at 1350 r.p.m.

The tests covered by this paper were conducted by advance students in automobile engineering, and in preparation and conduct extended over 10 months. Great care was exercised in set-up and procedure and no pains spared in an effort to get reliable and authoritative data. The engine used was of the six-cylinder, L-head type, with 4½ by 5¼-in. cylinders cast in triplets, recirculating splash lubrication, and forced water cooling.

Runs were made at 640, 1000 and 1350 r.p.m., which represent average operating speeds of the engine, and which for one of the prominent makes of cars in which this particular engine is used, correspond to car road-speeds of about 18, 28 and 39 m.p.h. At each speed, runs were made with the engine developing various horsepowers, which cover the normal operating range. For example, at an engine speed of 640 r.p.m. corresponding to a car speed of 18 m.p.h., runs were made developing 5, 10, 15 and 20 hp. The maximum output at this speed was about 25 hp.

Estimates for the horsepower required to overcome road and air resistance under favorable conditions for the car in question gave 5 at 18 m.p.h., 9.5 at 28 m.p.h. and 17 at 39

m.p.h. A fair estimate of the efficiency of power transmission through the gear box, differential, rear axle and tires including slippage would give 80 per cent at 39 m.p.h., 75 per cent at 28 m.p.h. and 70 per cent at 39 m.p.h. Upon this basis it is clear that, in order to propel the car under average favorable conditions on the road, the engine would have to develop 6.25 hp. at 18 m.p.h., 12.7 hp. at 28 m.p.h. and 24.3 hp. at 39 m.p.h.

Horning on Tractor Engines

H. L. Horning, engineer of the Waukesha Motor Co., who was down on the program for a paper entitled the Ultimate Type of Tractor Engine, did not read his paper, but instead, delivered a rather illuminating address of the subject.

Mr. Horning said that nothing since the discovery that a hook on the end of a pole would aid in the art of agriculture, had promised to benefit man to such an extent. It will be a factor in reducing the high cost of living. The value of land may be appreciated when it is mentioned that it takes 4 acres to keep a horse alive for a year. The tractor is a work horse and not a race horse and unlike the aero engine which may be overhauled every 120 hr. the tractor engine must keep on indefinitely in spite of abuse.

The tractor must have the ability to keep on going. And it must keep on going under difficulties that are enormous. Take the matter of oiling, which is so important. Yet instead of getting the proper oil the tractor is apt to get the product of mail order houses which is anything but correct. In one case it was found that a farmer had been using linseed oil in his engine. The use of kerosene also reduces the viscosity of the oil with the result that the rings in the top groove wear three times as rapidly as those in the lower ones. Mr. Horning said he had seen rings wear out in 2 days while working at 106 deg. in the shade in a Kansas dust cloud.

In securing efficiency the speed of the engine and the attainment of higher mean effective pressure are the cardinal points. The design of the combustion chamber must be watched and numerous pockets and solid parts to cool must be avoided.

What the tractor engine has to work against may be seen when the farmers' method of regulating speed is known. He will sink his plough and if it is too deep, cutting the speed of the tractor down too far, he will lift it a little so that the desired speed is attained. In other words the engine is working constantly at maximum torque speed. In every way this is the most difficult work that can be put on this type of engine as it represents constant wide open throttle work or what would be parallel in automobile practice to a car that is climbing a grade constantly at the highest possible speed that it can be made to negotiate the hill.

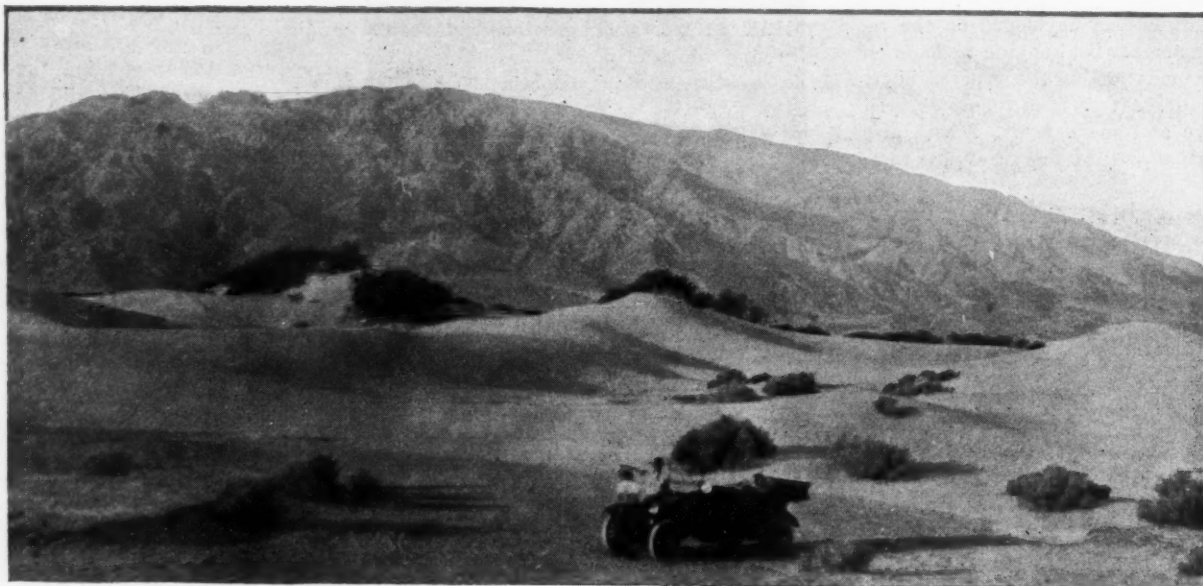
The cooling of the spark plug must be carefully watched and the waterjackets arranged so that a vertical flow of heat will be maintained down the valve stem. Eighty per cent of the troubles are around the exhaust port and the flow of heat on the valve is down the stem from the center of the valve head. The matter of the valve seat is a compromise. If the seat is too narrow the valve will not cool and if it is too wide carbon will form on account of the excessive cooling.

In speaking of the results accomplished in the laboratory Mr. Horning said that he had been able to secure with tractor engines a performance equal in car practice to 42,000 miles of travel at 45 miles per hour up the steepest hill that the car could climb at that speed.

(Concluded on page 20)

Conquering Death Valley

Record of Perilous Trip by Dodge a
Prized Possession of the Makers



O. K. Parker with the Dodge car which conquered Death Valley. This photograph was taken in the middle of the earthly gehenna

ONE of the valued possessions of Dodge Bros. is a sheet of paper signed by one O. K. Parker, an engineer and a member of the American Society of Civil Engineers. It is an affidavit telling of a journey through Death valley in California, made by Mr. Parker, and it describes briefly a most exciting and hazardous motor expedition.

Death Valley, a huge, irregular trough, lies between the Panamint mountain range on the west and the Funeral range to the east, approximately 300 miles north-east of Los Angeles. The valley is 100 miles long and 6 to 14 miles wide, a barren and treacherous waste with a record for more deaths by starvation and thirst within its boundaries than any other equal area on earth.

Panamint Altitude 2 Miles

The Panamint range attains an elevation of 2 miles. The Funeral range rises more than 1 mile. On the high summits there are snow, cold and water. The valley, lying deep in the hollow, bakes in a temperature of 144 degrees Fahrenheit. In its bosom there are sand, heat and aridity. Many men, wandering helplessly, partly blinded by sand, parched, hungry and miserable, have gazed from the midst of the ensnaring desert to the life-saving, snow-capped peaks, goading themselves further and further in their vain efforts to reach the goal, only to fall headlong into the pitfalls about them, too weary to continue, too feeble to try, too heartsick to care.

By Allen Sinsheimer

The malarial jungles of Africa, the unexplored wilds of South America, and the frigid regions of the Arctic are no more harrowing, nor perilous, than is this short and narrow earthly gehenna with its fiery heat blasts, violent windstorms, torrential summer deluges and soft, heavy sand waves more dangerous than any storm-ridden sea.

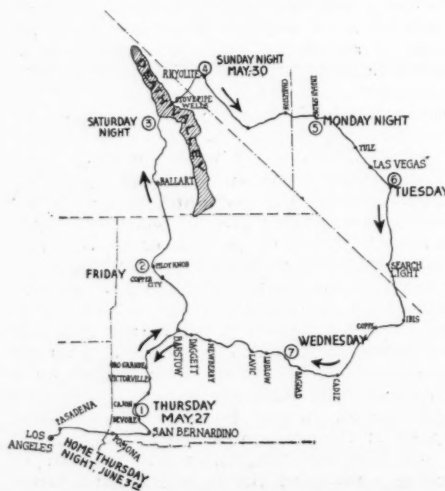
It is a desert floored with masses of rocks and boulders, the first 4 miles across its waste are level, bottomless sand drift mounds. Erratic winds, blowing around the shoulder of the Panamints, shift them constantly. Everywhere there are huge

"malapai fingers," the weeds of the desert with their hard, flat roots protruding above the sand, and their thistle-covered stalks standing high, and looking much like silent sentries who would warn the adventurous to turn back.

Sand Dunes Like Ocean Waves

Farther on, the floor is a long waste of sand dunes running parallel with the valley and similar to ocean waves, 10 to 15 ft. high and 300 to 400 ft. from crest to crest. They continue for 8 miles and though more permanent than the lower mounds on either side, shift when the terrific windstorms break over the desert. Here and there among the dunes are dangerous salt marshes and borax flats, hungry to devour anything that treads their surfaces. Frequently a slight wind plays about the summits of the giant dunes, starting small crusts to movement. Soon the entire mound breathes. The sand begins to slide in torrents. One dune after another rolls and the floor of the valley resembles the receding rollers of the sea-shore.

In the boom mining days of southwest Nevada, when Rhyolite, Beatty, Goldfield and Tonopah were gold camps of wild excitement, many travelers crossed Death Valley. Brush was laid to mark the route from Stovepipe Wells on the east to the mouth of Emigrant canyon on the west, and a telephone line was run from Skidoo to Stovepipe Wells. But the mines refused to yield the desired treasure. The mining camps failed. The boom broke.



Map showing route taken by Death Valley Dodge

Stovepipe Wells was abandoned. The crossing was neglected. Nature's elements again assumed full sway. The wild torrential summer storms, the powerful winds and the heavy sand blows swept the length and breadth of the floor of this desert of deserts, and every important trace of man's feeble efforts to establish a road of travel was obliterated. To-day, nature is still the victor. The only existing evidence of the human beings who visited the desert are faint ruts of a road on the roots of the malapai fingers.

This is the land over which many miners and explorers, seeking gold or fame, have traveled and encountered indescribable tortures, and it is the narrow stretch over which Mr. Parker, sitting behind the wheel of a Dodge, shot the sand dunes, drove over the boulders, escaped the marshes and successfully crossed to safety on the opposite side.

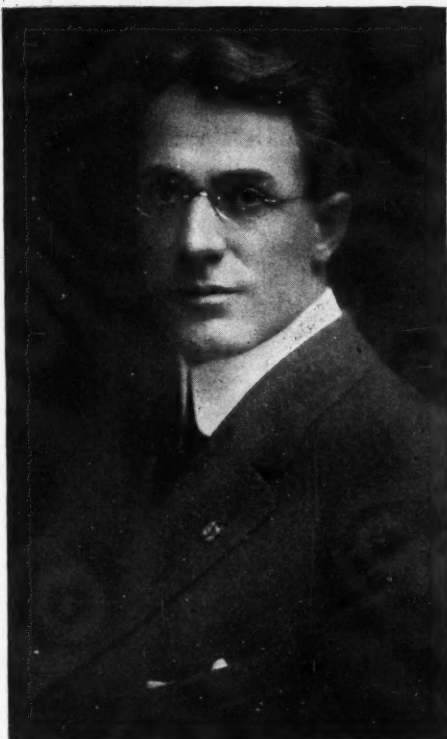
His journey through Death Valley started at Ballarat, 200 miles from Los Angeles, and ended at Rhyolite. Leaving Los Angeles with two assistants, Mr. Parker drove northeast to Ballarat, crossed the north end of Ballarat Sink and commenced the climb over the dangerous Wild Rose canyon road to the summit of Skidoo in the Panamint range. In 12 miles this road rises 1 mile to the head of Emigrant canyon where the descent to the floor of Death Valley begins. Skidoo summit is 265 miles from Los Angeles.

Take Extra Precaution

The car arrived at the summit late in the afternoon. The party stopped to take several photographs and then continued on to Emigrant Springs 4 miles below, and the last stop on the west side of the desert where drinking water could be secured. Realizing the hazardous character of the journey and knowing that every hour of daylight would increase the heat of the valley, they retired early in the evening for a few hours of rest, planning to arise shortly and reach the edge of the desert by daylight.

The party awoke at 1 a. m. and made final preparations. To protect themselves against possible disaster, two galvanized iron buckets were filled with water as an extra supply. One was placed under the edge of a cliff about 5 miles from camp, the other below a mesquite bush near the sand flats. It was planned, in event the car broke down, that the party would retrace its tracks on foot and would thus have a water supply both at the edge of the desert and part way up the canyon.

The journey commenced in earnest at



O. K. Parker, who conquered Death Valley in a Dodge

2 a. m. It required 3 hours to fight the way down Emigrant canyon over and through the masses of sand and boulders. The edge of the desert was reached just before daybreak. The party stopped to arrange the course across the valley to the mouth of Boundary canyon in the Funeral range. Tires were flattened by the release of all but 15 lbs. of air to insure additional pulling power.

The assistants seated themselves on the running boards and were told to hang on tight. The car started with a run of 1000 ft. and attained a speed of 25 m.p.h., striking the sand with every ounce of pulling power, and with the aid of the momentum gained, started the ride of the lower mounds of the first 4 miles, continuing successfully to the edge of the great dunes.

As it approached the giant sand hills the driver's heart almost failed him. There were 8 miles of them—a sea of sand waves 10 to 50 ft. high—and not a mark of a track nor apparently a fraction of a chance to drive the car across. The task seemed one of desperation. The huge mounds had sloping sides and hard crust summits that caused a precipitate drop each time the car attained the top. Often the wind had scooped out the far side and

the machine would fall several feet as it cleared the crest and prepared to climb the next.

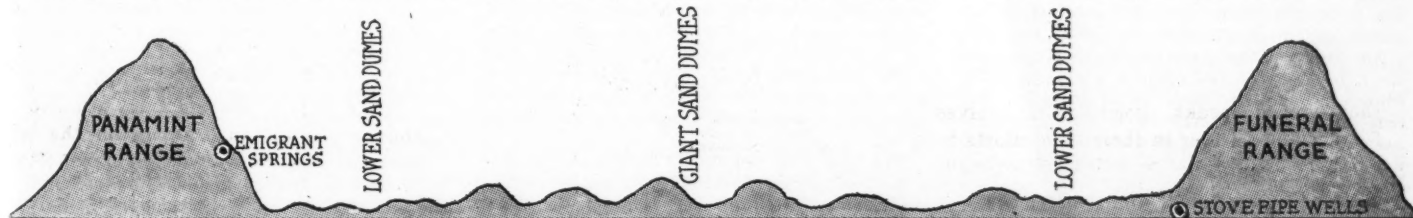
The assistants clung to the sides of the machine. The driver shouted a warning. All possible power was gathered, and the car made its dash up the first dune, a drive of 200 ft. to a height of 20 ft. above the desert. It proved to be a rolling mound. Each side sloped gradually toward the valley floor. The car shot down the far side with increased speed. Another shout and it mounted the next, about 10 ft. higher than the first. This was under-scooped on the far side. The car topped the summit, quivered and dropped, and continued its wild travel with one of the assistants just saving himself from a severe fall by swinging clear of the machine, but maintaining a desperate grip on the door and robe rail. Had he fallen the car would have been forced to halt with a straight high dune directly behind and a monster ahead with little chance of mounting it from a stand-still start.

Momentum Aids Car

The momentum and high speed aided the car on its way. It mounted one dune after another. Here was need for a firm hand as the car dropped and bounded on. There was a sudden turn that narrowly avoided a dangerous marsh. Everywhere and always there were dangers that demanded caution. Happily the car escaped the weeds, the flats and the boulders, and arrived safely in the center of the great dunes, 4 miles from their edge, where the party discovered a small wind-blown flat with a crust sufficiently hard to permit a halt. They stopped, and with the sun just rising over the range, snapped a photograph, probably the only one ever taken, in the center of Death Valley.

After a short rest the journey was resumed. There was an added confidence gained with the success of the first start. Speed and momentum were again secured with a run on the level. The car struck another of the high dunes and faltered. The motor almost stalled. Both assistants leaped from the machine and gave it a final shove over the summit, that carried it clear and ready for the next dune. There were more crashes, more dangerous drops and additional hazards in these last 4 miles across the great mounds, but the car arrived, without a stop, on the edge of the low sand hills that lead to the other side of the desert.

The car traveled on and arrived at the foot of the Talus slope within 100 ft. of



Cross-section of Death Valley, showing mountain ranges on each side and dunes in between

the little adobe hut, now crumbling into decay, which formerly afforded shelter at Stovepipe Wells. All that remains of the Wells is a dugout in the sand, about 8 ft. long, 4 ft. wide and 4 ft. deep. At the bottom of the excavation is a green seum indicative of moisture, which if shoveled would yield about a pint of water; enough to mean the saving of a human life.

Following inspection of the dugout, an additional 10 lbs. of air was pumped into the tires and the climb up the Talus grade to the mouth of Boundary canyon commenced. It was more of a strain than shooting the giant dunes. Frequently the rear wheels dug holes in the sand and the machine would slide back 1 ft. for every 2 ft. gained. The climb is 2 miles with a

grade of 12 to 16 per cent and it is quite likely that an accident in between the 400-lb. boulders that dot the road would have left the fate of the party in doubt for all time.

Cross Valley in 8½ Hours

The summit of Boundary canyon was attained. It was, then, but a short journey to Daylight Springs, where the car arrived at 11 a. m., making the trip across the floor of Death Valley, a distance of 14 miles, in 8½ hrs., including the time for taking the photograph in the center of the desert.

The elevation of 4337 ft. at Daylight Springs produced a delightful coolness compared with the burning heat rays of the valley and each member took turns at a bucket bath, and retired in the shade

of the car for a rest of a few hours. The remainder of the journey to Rhyolite was accomplished without difficulty.

Thus the expedition ended. H. A. Arnold, Dodge dealer in Los Angeles, who wanted to know the durability of his car in rough, untraveled country, and who planned and authorized the journey, learned just what the machine will stand. Mr. Parker, who has traveled all of the unfrequented regions of the Southwest and calls the Death Valley trip the most desperate in his experience, has learned all about the desert. In all, it was a most exciting and interesting excursion, but it is a most unpleasant speculation to think of the consequences of a tire blow-out or a loosened cotter pin while the car was working its way across the sand waves.

Where Power Losses Go

(Concluded from page 17)

Some rather unusual statements were made by N. W. Akimoff in his paper on the Dynamics of the Automobile. These in part seem to be contradictory to general belief.

The plunging period, aside from giving an idea as to its relation to the pitching period, is of no special interest. But the formula for pitching period suggests:

The weight proper of the car does not enter directly and is only implied by the initial static deflection of the springs. This deflection, however, is quite as characteristic of the springs as it is of the weight.

The distribution of the weight appears to be of importance, as is evidenced by the radius of gyration k , to which the period is directly proportional. In other words, to secure easy riding—slow period of pitching—the loads should be placed as far as possible from the center of the car. The mere fact that they give the same deflection does not in itself preclude the possibility of entirely different effects due to load distribution.

The wheelbase should be kept as short as possible, because the period is inversely proportional to its length. This, of course, does not mean that it should be reduced to ridiculous proportions; the practical requirements of safety, static stability and appearance will at once fix limits in this respect; but these will be lower limits, for each type of car. It can likewise be shown that the linear up-and-down acceleration of the extreme points of the car, such as the rear seat, is practically proportional to the third power of the wheelbase; hence another reason why this dimension should be kept short.

If a car with a large wheelbase rides easily, this is not due to the wheelbase itself, but to the fact that its larger value means a larger car, in general, a larger body and possibly a greater radius of gyration. It is possible to imagine a case in which the wheelbase has been increased and the weight distribution and the radius of gyration, in fact the whole body, has been left unchanged. Such a car, other things being equal, will not ride so well.

As regards the cantilever-spring arrangement, in favor of and against which so many subjective opinions have been advanced, the true explanation seems to be easy enough. Assuming that we have two identical cars, the wheelbase, initial—static—spring deflection and everything else being the same, one provided with cantilever springs and the other, say, with full-elliptic springs. If the cantilever arrangement gives better riding quali-

ties, the reason lies in the fact that the spring is fastened more closely to the center of the body, thus giving the same effect as would a reduced wheelbase, that is, a slower period of pitching.

High-Speed Engine Design

Essential features of high-speed engines were discussed by A. F. Milbreath, secretary and engineer of the Wisconsin Motor Mfg. Co., which built the Stutz engine.

In high speed engines it is, of course, necessary to reduce reciprocating weights to a minimum; from this viewpoint, a small diameter of cylinder with a long stroke is favorable since the weight of a piston increases with some power of the diameter between the second and third, and the inertia forces of the piston vary likewise as long as the piston speed is constant.

On the other hand, however, the weight of the engine will increase with a longer stroke: crankcase diameter increasing with the stroke while the height of the cylinder increases with the length of the connecting-rod, which is about twice that of the stroke. Further, the valve area will decrease with a smaller bore unless large valve pockets are used. In Europe stroke-bore ratios as high as 2 have been used successfully. From the author's experience, ratios of 1.70 or 1.75 have given good results in 300-cu. in. engines.

Engine speeds will depend principally on the valve area and timing, size and form of inlet manifold, location of spark plugs, and on the resistance offered by the carbureter to the incoming charge. Valve location will also affect engine speeds to some extent.

The valve area should be as large as possible, but it will be limited, of course, by the size of the combustion chamber. The largest valve area can undoubtedly be obtained by using two intake and two exhaust valves per cylinder, placed on an angle of about 20 to 30 deg. from the vertical. With this construction, four valves 1¼-in. diameter of 1⅝ in. clear can be incorporated in a 3¼-in. cylinder without resorting to pockets. This will give ample capacity to develop a maximum horsepower at 3000 r.p.m. On a 300-cu. in. engine this would give an actual gas velocity of about 200 ft. per sec. through the valves when using a valve lift of ⅝ in.

The inlet manifold should be of a size to give a gas velocity of about 175 ft. per sec. The manifold as well as gas passages in the cylinder must be smooth and as free from sharp bends as possible. With some carbureters an

extra air inlet in the manifold above the carbureter will increase the power at high speeds, but with most modern carbureters built for this service the air passages are free enough so that the air inlet in the manifold is not necessary.

The volume of compression space for the high speed of engine should be about 18 to 20 per cent of the total volume. This will give compression pressure of about 90 to 110 lbs. per sq. in. gage. The combustion chamber should be free from pockets. The more nearly spherical the shape the better it is for rapid flame propagation and gas flow, and also for reduction of heat loss to jacket water.

Valves must be made of the best material procurable. Tungsten steel serves admirably. The heads can be extremely thin, increasing from ⅜ in. at the outer edge gradually toward the center with ample fillets at the stem. The valves should be of as light weight as possible, as even then great spring pressures are necessary to close them quickly, and make the valve lifters follow the cams. The diameter has already been discussed, and should be of such size as to give gas velocities of not over 200 ft. per sec. The lift of valves can be as high as one-quarter of the diameter, but for extremely high speeds it is well to keep the lift as small as possible, thus reducing the inertia forces in the valve and the stresses in the springs. Springs must be carefully designed and made of best materials or failure will result.

It is often deemed advisable to use double springs, an outer or main spring, and an inner or auxiliary spring. The stresses in the inner spring are kept lower than in the main spring so that the factor of safety will be large. With the double-spring construction the valve will not fall into the cylinder should a main spring break.

The acceleration of the valve can be ascertained most easily by a graphical method, as usually with the customary shapes of cams, the acceleration is not uniform. When the acceleration is known and the weights of the valve, cam-follower spring-seat and one-half that of spring are known the necessary spring pressure to close the valve in the given time can be calculated by the formula $P = Wa/g$, in which P = spring pressure, W = weight of valve and parts just enumerated, a = acceleration in feet per second, and g = acceleration due to gravity.

In actual practice at engine speeds of 3000 r.p.m. spring tensions of 80 lb. with valve seated, have been satisfactory on 1¼-in. valves weighing with accompanying reciprocating parts 0.9 lbs.

New York Show Aftermath Briefly Told

(Continued from page 14)

president, has a new type of motor ready for production, the first of which will be exhibited at the Chicago show.

* * *

The most unusual of the exhibits at the Palace was one which arrived after the show had opened, and which was the object of much interest on account of its freakish design. This was the Ingram-Hatch car, in which was combined an air-cooled engine operating on kerosene with double-friction drive, low differential, spring wheels with sectional tires made out of a vegetable compound in leather casings. No spark plugs are used, these being replaced by what are called thermo-igniters, being an electric adaptation of the original hot tube system of ignition, the tube being heated electrically. There is only one set of valves, these actuating both ports, and being operated by overhead cams. The car, as exhibited, was very crude.

* * *

The Champion Spark Plug Co., Toledo, in addition to the exhibit at the Palace, had a special exhibit at the Hotel Astor.

* * *

Premier and Harroun cars arranged at the show for distribution along the Pacific Coast. J. W. Leavitt & Co., San Francisco, is to handle both lines, the Harroun territory covering California, Nevada and Arizona, the Premier territory given Leavitt embraces the lower half of California and practically all of Nevada. The Leach Motor Car Co., Los Angeles, will handle the other half of the state and practically all of Arizona for the Premier.

* * *

Sales of cars at this year's Automobile Salon show an increase of 100 per cent over one year ago. From the opening on Jan. 2 up to Tuesday night sales amounted to \$400,000 and were expected to pass the \$500,000 mark when the final returns were completed.

* * *

With the appointment of Eugene Elliott, formerly Production Manager for the Haynes Automobile Co., Kokomo, Ind., as Eastern sales manager of the Smith-Form-A-Truck Co., and A. F. Johnston, formerly sales manager of the Automatic Carburetor Co., as Western sales manager, comes the announcement of the new sales plans of the Smith company. The territory is divided into major blocks under different managers and sub-divided into territories under from four to eight factory representatives and service managers. The Eastern territory covering that east of the Mississippi is divided into twenty-four major divisions.

Although no trucks are admitted to the exhibits at the Grand Central Palace, truck exhibits are to be found all over the city. Four years ago it was decided that motor truck shows did not pay and so they were discontinued. Nevertheless a number of motor truck manufacturers and makers of converters for Fords and other light passenger cars have rented expensive quarters in the hotels and in vacant stores throughout up-town New York for the exhibition of their chassis.

* * *

In the show proper a number of exhibitors, such as the Smith Form-A-Truck Co., are to be found, these being considered as accessories, although the complete vehicle with body and all is exhibited. Makers of parts for trucks alone, such as heavy axles, cast steel wheels, etc., are there, but the truck makers who would exhibit are forced to seek the attention of the dealer outside the show.

* * *

The Hurlburt Motor Truck Co., New York, has rented quarters in the Biltmore Hotel, where its 3½- and 5-ton chassis are on view. The Fulton Motor Truck Co., Farmingdale, N. Y., has its new 1½-tonner in one of the parlors of the Waldorf-Astoria. The Maxwell company is showing its new 1-tonner at the Biltmore. The Auto-car has space at the Martinique. The Hurd has rented space across the street from the Palace. In the street outside the building, shivering salesmen bid for the attention of passers-by to various makes of adapters attached to Fords, and to the Rush, Koehler and Vim light trucks.

* * *

Among those who attended the New York show last week were four dealers and sub-dealers of Studebaker cars who had won the trips to New York for making the sales to the most prominent men on the Studebaker "Prominent Buyers' Day" contest held recently. The winners were P. Gray Coburn of Norfolk, Va., who sold a car to Josephus Daniels; the Holmes Garage, Danville, Ill., which sold a car to Joseph Cannon; E. V. Barthmeir, who made a sale to Philander C. Knox, and C. R. Douglas, Westfield, N. Y., who secured Dr. C. G. Welch, the grape-juice king, as a customer. F. O. Henizer of Cleveland, a sub-dealer, selling through the Studebaker Corp. of Ohio, also won a prize through his sale to Frank Rockefeller.

RUBBER CLUB ELECTS

New York, Jan. 13—Officers and executives of the Rubber Club of America were re-elected at the annual meeting this week. The name of the club is changed to the Rubber Association of America. The official personnel follows: President, H. S. Firestone; vice-presidents, V. H. Cartwell, Kelly-Springfield Tire Co., and H. S. Hotchkiss, U. S. Rubber Co.; secretary and treasurer, H. S. Vorhis.

I. M. C. A. Formed Body Will Clip Difficulties from Motoring

PHILADELPHIA, Pa., Jan. 15—To be able to travel anywhere with convenience, with perfect assurance of being recognized as a motorist of responsibility and of receiving first-class accommodations, is the purpose of the International Motor Clubs Association. The I. M. C. A., as it is called, is still in its infancy, but has prospects of becoming one of the largest as well as most unique associations of motorists in existence.

The association, with headquarters in Philadelphia, was founded a little more than two years ago as the result of a meeting of five men at a social club. Each had some special grievance against the existing order of things, and when it was decided to organize the I. M. C. A., it was given the motto "Motor without annoyance."

It often happens that a motorist in a strange city, not being familiar with its traffic regulations, runs amuck of the police department, and is sometimes fined for his ignorance of the law. If he is a member of the I. M. C. A. he is provided with a slip addressed to departments of public safety and magistrates certifying that the member whose name and photograph is attached "has received the personal indorsement of his bank as a citizen of responsibility who would not intentionally violate any law or ordinance governing traffic or safety regulations."

The object of this is to serve as a voucher that the member will appear in person or by attorney upon receipt of notice of action and will pay any fine or costs imposed upon adjudication of any charge for violation of the law governing motor cars.

FORD DEALERS ORGANIZE

Baltimore, Md., Jan. 15—Following the lead of a number of cities the dozen Ford agents of this city met last week and organized the Ford Dealers' Association of Baltimore.

The body sent a letter to the Ford company, in which it asked that all prospects be divided equally between all of the city dealers. The plan of the Ford company is to hand over prospects to the dealers located in the sections of the prospects. This the dealers' association think is unfair.

The dealers also are working on a basis for the hourly service charge in garages and with this done all of the dealers will have a fixed charge for Ford repairs. Those who first started the move here to organize the local dealers did so following the reading of accounts of other cities which appeared in MOTOR AGE recently.

Alabama Gets Highway

Arm of Jackson to Go Through This State as Far as Montgomery, Possibly to Mobile

New Field Secretary Appointed After Birmingham Meeting

LOUISVILLE, Ky., Jan. 13—L. P. Haney, Louisville, now connected with the state department of roads as division engineer, is the new field secretary of the Jackson Highway Association, according to announcement made yesterday, following the return of President Peter Lee Atherton, Eugene Stuart and Emory G. Dent, the latter of Bowling Green, from the meeting of the association held in Birmingham Thursday. Mr. Haney will have headquarters in Louisville with President Atherton. He will begin his duties March 1.

Messrs. Atherton and Stuart, who held the proxies of Kentucky and Indiana members, also brought back the news that a spirited session had ended in a vote to extend the Jackson highway through Alabama under an arrangement whereby the extension will be known as the Alabama-Jackson highway and the Alabama organization will have a separate incorporation, although it will have representation in the main association. This project caused a break at the Jackson Highway Association meeting which was held in Louisville last October, because the Mississippi delegates who won out in securing the official routing of the main road through Mississippi instead of Alabama, insisted upon having a whole victory or nothing.

At Thursday's meeting, however, the arrangement described was satisfactorily regarded by the Mississippi contingent at the close of the meeting and all elements in the organization now have been harmonized.

STUDEBAKER BUYS STAVER

Chicago, Jan. 15—The plant of the Staver Carriage Co., here, has been purchased by the Studebaker Corp., which will use it for the assembling of cars. This plant covers the block between 76th and 77th streets, between the Rock Island line on the east and the Chicago Belt line on the west. The buildings are four stories and contain approximately 300,000 square feet of floor space, being well suited for assembly work.

The plant will be put in operation as soon as the necessary equipment can be installed. It is expected that with this assembly plant in Chicago, it will be possible to give better service to dealers in the west and northwest. Better shipping facilities are said to have prompted Studebaker to make this move, since the possibility of getting freight cars in Chicago are considerably better than in points East.

Competitive Records—1909 to Date

DIVISION ONE SPEEDWAY RECORDS, CLASS "B" STOCK CAR SPEEDWAY RECORDS, CLASS "B" STOCK CHASSIS

(Piston Displacement)
161 TO 230 CUBIC INCHES

Distance Miles	Time	Driver	Car	Place	Date
4	3:49.00	Witt	E. M. F.	Atlanta	Nov. 3, 1910
5	4:35.47	L. Chevrolet	Buick	Indianapolis	July 2, 1910
10	8:55.40	L. Chevrolet	Buick	Indianapolis	July 2, 1910
20	19:51.00	Knipper	Chalmers	Atlanta	Nov. 12, 1909
50	50:36.00	Nelson	Buick	Atlanta	Nov. 9, 1909
100	1:40:46.81	Knipper	Chalmers	Atlanta	Nov. 10, 1909

231 TO 300 CUBIC INCHES

5	4:16.00	Dawson	Marmon	Indianapolis	July 2, 1910
10	8:16.08	Harroun	Marmon	Indianapolis	May 27, 1910
20	17:10.70	Chevrolet	Buick	Atlanta	Nov. 11, 1909
25	21:48.92	Harroun	Marmon	Indianapolis	May 30, 1910
50	42:41.33	Harroun	Marmon	Indianapolis	May 30, 1910
75	67:31.07	Harroun	Marmon	Atlanta	Nov. 11, 1909
100	1:30:08.31	Harroun	Marmon	Atlanta	Nov. 11, 1909

301 TO 450 CUBIC INCHES

5	4:05.76	Kincaid	National	Indianapolis	May 27, 1910
10	7:55.12	Aitken	National	Indianapolis	July 2, 1910
15	11:48.78	Aitken	National	Indianapolis	July 1, 1910
20	15:57.63	Dawson	Marmon	Indianapolis	May 27, 1910
50	39:47.35	Dawson	Marmon	Atlanta	Nov. 3, 1910
75	1:00:16.34	Dawson	Marmon	Indianapolis	May 27, 1910
100	1:23:43.11	Kincaid	National	Indianapolis	May 27, 1910
150	2:05:02.17	Chevrolet	Buick	Atlanta	Nov. 9, 1909
200	2:46:48.47	Chevrolet	Buick	Atlanta	Nov. 9, 1909
250	4:38:57.40	Burman	Buick	Indianapolis	Aug. 19, 1909

451 TO 600 CUBIC INCHES

5	4:01.36	Oldfield	Knox	Indianapolis	May 30, 1910
10	7:47.71	Robertson	Fiat	Atlanta	Nov. 11, 1909
20	15:57.41	De Palma	Fiat	Atlanta	May 5, 1910
50	42:02.98	Robertson	Fiat	Atlanta	Nov. 13, 1909
100	1:22:35.35	Robertson	Fiat	Atlanta	Nov. 13, 1909
150	2:05:00.63	Robertson	Fiat	Atlanta	Nov. 13, 1909
200	2:53:48.32	Disbrow	Rainier	Atlanta	Nov. 13, 1909

SPEEDWAY RECORDS, CLASS "C" NON-STOCK (Piston Displacement)

161 TO 230 CUBIC INCHES

5	4:20.20	J. Nikrent	Buick	Los Angeles	April 15, 1910
10	8:40.17	J. Nikrent	Buick	Los Angeles	April 15, 1910
15	13:14.52	J. Nikrent	Buick	Los Angeles	April 9, 1910
20	17:37.36	J. Nikrent	Buick	Los Angeles	April 9, 1910
25	21:12.42	Tower	Flanders	Los Angeles	May 5, 1912
50	43:49.69	Endicott	Cole	Los Angeles	April 9, 1910

231 TO 300 CUBIC INCHES

1	0:45.60	De Palma	Mercer	Los Angeles	May 5, 1912
2	1:31.53	De Palma	Mercer	Los Angeles	May 5, 1912
3	2:17.17	De Palma	Mercer	Los Angeles	May 5, 1912
4	3:02.70	De Palma	Mercer	Los Angeles	May 5, 1912
5	3:47.34	De Palma	Mercer	Los Angeles	May 5, 1912
10	7:27.33	De Palma	Mercer	Los Angeles	May 5, 1912
15	11:11.17	De Palma	Mercer	Los Angeles	May 5, 1912
20	14:56.05	De Palma	Mercer	Los Angeles	May 5, 1912
25	18:53.20	J. Nikrent	Case	Los Angeles	May 5, 1912
50	42:30.08	Siefert	Dorris	Los Angeles	April 8, 1910
75	1:03:54.28	Harroun	Marmon	Los Angeles	April 8, 1910
100	1:25:22.07	Harroun	Marmon	Los Angeles	April 8, 1910

301 TO 450 CUBIC INCHES

5	3:49.36	J. Nikrent	Buick	Los Angeles	April 17, 1910
10	7:36.61	J. Nikrent	Buick	Los Angeles	April 17, 1910
15	12:04.99	Dawson	Marmon	Los Angeles	April 15, 1910
20	16:04.40	Harroun	Marmon	Los Angeles	April 15, 1910
25	20:08.69	Harroun	Marmon	Los Angeles	April 15, 1910
50	39:53.55	Harroun	Marmon	Los Angeles	April 15, 1910

451 TO 600 CUBIC INCHES

5	3:38.61	Oldfield	Knox	Los Angeles	April 16, 1910
10	7:20.66	Oldfield	Knox	Los Angeles	April 16, 1910
15	11:32.34	Marquis	Isotta	Los Angeles	April 10, 1910
20	15:29.18	Marquis	Isotta	Los Angeles	April 10, 1910
25	19:24.92	Marquis	Isotta	Los Angeles	April 10, 1910
50	39:20.69	Marquis	Isotta	Los Angeles	April 10, 1910

DIVISION TWO NON-COMPETITIVE RECORDS SPEEDWAY RECORDS, CLASS "B" STOCK CAR (Piston Displacement)

231 TO 300 CUBIC INCHES

10	7:54.40	Mulford	Hudson	Sheepshead Bay	Nov. 25, 1915
20	15:45.80	Mulford	Hudson	Sheepshead Bay	Nov. 25, 1915
50	39:30.80	Mulford	Hudson	Sheepshead Bay	Nov. 25, 1915
100	1:20:21.40	Mulford	Hudson	Sheepshead Bay	Nov. 29, 1915

SPEEDWAY RECORDS, CLASS "B" STOCK CHASSIS (Piston Displacement)

160 CUBIC INCHES AND UNDER

1	0:56.80	Witt	Flanders	Indianapolis	Nov. 13, 1911
5	4:22.98	Witt	Flanders	Indianapolis	Nov. 13, 1911
10	9:27.49	Witt	Flanders	Indianapolis	Nov. 13, 1911
15	14:13.26	Witt	Flanders	Indianapolis	Nov. 13, 1911
20	19:00.87	Witt	Flanders	Indianapolis	Nov. 13, 1911

SPEEDWAY RECORDS, CLASS "C" NON-STOCK (Piston Displacement)

160 CUBIC INCHES AND UNDER

5	4:26.08	Evans	Flanders	Indianapolis	Nov. 13, 1911
10	8:53.97	Evans	Flanders	Indianapolis	Nov. 13, 1911
15	13:24.00	Evans	Flanders	Indianapolis	Nov. 13, 1911
20	17:54.82	Evans	Flanders	Indianapolis	Nov. 13, 1911

SPEEDWAY RECORDS, REGARDLESS OF CLASS, STOCK SPEEDWAY RECORDS, REGARDLESS OF CLASS, NON-STOCK

1/4	8.16	Burman	Blitzen-Benz	Indianapolis	May 29, 1911
1/2	16.60	Oldfield	Christie	Tacoma	July 5, 1915
*1	21.40	Burman	Blitzen-Benz	Indianapolis	May 29, 1911
1	31.60	Oldfield	Christie	Tacoma	July 5, 1915

Distance Miles	Time	Driver	Car	Place	Date
2	1:10.00	Oldfield	Christie	Tacoma	July 5, 1915
3	1:54.83	Bragg	Flat	Los Angeles	May 5, 1912
4	2:33.37	Bragg	Flat	Los Angeles	May 5, 1912
5	3:00.00	Orr	Maxwell	Omaha	July 5, 1915

ONE MILE CIRCULAR DIRT TRACK RECORDS, STOCK ONE MILE CIRCULAR DIRT TRACK RECORDS, NON-STOCK

1	46.20	Disbrow	Simplex	St. Louis, Mo.	Aug. 8, 1914
2	1:32.60	Disbrow	Simplex	St. Louis, Mo.	Aug. 8, 1914
3	2:27.81	Disbrow	Simplex	Cleveland, O.	Sept. 14, 1912
4	3:17.02	Disbrow	Simplex	Cleveland, O.	Sept. 14, 1912
5	4:06.58	Disbrow	Simplex	Cleveland, O.	Sept. 14, 1912

STRAIGHTAWAY RECORDS, CLASS "B" STOCK CHASSIS

(Piston Displacement)					
1	35.11	Mulford	231 TO 300 CUBIC INCHES		
			Hudson	Daytona	April 10, 1916
			301 TO 450 CUBIC INCHES		
*1	26.75	Merz	National	Jacksonville	Mar. 29, 1911
1	40.32	Wilcox	National	Jacksonville	Mar. 30, 1911

STRAIGHTAWAY RECORDS, REGARDLESS OF CLASS, STOCK STRAIGHTAWAY RECORDS, REGARDLESS OF CLASS, NON-STOCK

*1	15.88	Burman	Biltzen-Benz	Daytona	April 23, 1911
1	25.40	Burman	Biltzen-Benz	Daytona	April 23, 1911
2	51.28	Burman	Biltzen-Benz	Daytona	April 23, 1911
5	2:34.00	Hemery	Darracq	Daytona	Jan. 24, 1906
15	10:00.00	Lancia	Flat	Daytona	Jan. 29, 1906

(Standing Start)

1	40.53	Oldfield	Benz	Daytona	March 16, 1910
---	-------	----------	------	---------	----------------

HOURLY RECORDS

SPEEDWAY, CLASS "B" STOCK CHASSIS

(Piston Displacement)						
231 TO 300 CUBIC INCHES						
12	924	Mulford	Hudson	Sheepshead Bay	May 1-2, 1916	
24	1,819	Mulford	Hudson	Sheepshead Bay	May 1-2, 1916	

SPEEDWAY RECORDS REGARDLESS OF CLASS, STOCK SPEEDWAY RECORDS REGARDLESS OF CLASS, NON-STOCK

1	40.23	De Palma	Mercedes	Des Moines, Ia.	June 24, 1916
2	1:12.85	Resta	Peugeot	Sheepshead Bay, N. Y.	Sept. 30, 1916
3	1:54.81	De Palma	Mercedes	Des Moines, Ia.	June 24, 1916
4	2:20.08	Resta	Peugeot	Sheepshead Bay, N. Y.	Oct. 9, 1915
5	2:56.35	Resta	Peugeot	Omaha, Neb.	July 15, 1916
10	5:45.03	Aitken	Peugeot	Sheepshead Bay, N. Y.	Sept. 30, 1916
15	8:54.72	Mulford	Peugeot	Omaha, Neb.	July 15, 1916
20	11:15.79	Aitken	Peugeot	Sheepshead Bay, N. Y.	May 13, 1916
25	15:00.38	Mulford	Peugeot	Omaha, Neb.	July 15, 1916
50	28:04.63	Resta	Peugeot	Sheepshead Bay, N. Y.	Oct. 9, 1915
75	45:05.31	Rickenbacher	Maxwell	Omaha, Neb.	July 15, 1916
100	56:57.72	Resta	Peugeot	Sheepshead Bay, N. Y.	Nov. 2, 1915
150	1:26:58.65	Aitken	Peugeot	Sheepshead Bay, N. Y.	Sept. 30, 1916
200	1:55:23.53	Aitken	Peugeot	Sheepshead Bay, N. Y.	Sept. 30, 1916
250	2:23:04.03	Aitken	Peugeot	Sheepshead Bay, N. Y.	Sept. 30, 1916
300	2:55:32.23	Anderson	Stutz	Sheepshead Bay, N. Y.	Oct. 9, 1915
350	3:24:42.99	Anderson	Stutz	Sheepshead Bay, N. Y.	Oct. 9, 1915
400	4:04:48.98	Resta	Peugeot	Chicago	June 26, 1915
450	4:35:05.78	Resta	Peugeot	Chicago	June 26, 1915
500	5:07:26.00	Resta	Peugeot	Chicago	June 26, 1915

ONE MILE CIRCULAR DIRT TRACK RECORDS, STOCK ONE MILE CIRCULAR DIRT TRACK RECORDS, NON-STOCK

10	8:16.40	Burman	Peugeot	Bakersfield, Cal.	Jan. 3, 1915
15	12:23.20	Burman	Peugeot	Bakersfield, Cal.	Jan. 3, 1915
20	16:25.60	Burman	Peugeot	Bakersfield, Cal.	Jan. 3, 1915
25	20:28.80	Burman	Peugeot	Bakersfield, Cal.	Jan. 3, 1915
50	40:57.80	Burman	Peugeot	Bakersfield, Cal.	Jan. 3, 1915
75	1:08:56.00	Burman	Peugeot	Galesburg, Ill.	Oct. 22, 1914
100	1:31:30.00	Alley	Duesenberg	Hamline, Minn.	Oct. 24, 1914
150	2:30:51.00	Wishart	Mercer	Columbus, O.	Aug. 25, 1912
200	3:21:48.00	Mulford	Mason Special	Columbus, O.	July 4, 1913

STRAIGHTAWAY RECORDS, CLASS "B" STOCK CHASSIS

(Piston Displacement)						
5	4:24.13	Towers	161 TO 230 CUBIC INCHES	Warren-Detroit	Jacksonville	Mar. 29, 1911
10	9:10.52	Towers		Warren-Detroit	Jacksonville	Mar. 30, 1911
			231 TO 300 CUBIC INCHES			
10	8:16.35	Wilson		Cole	Jacksonville	Mar. 29, 1911
			301 TO 450 CUBIC INCHES			
5	3:56.82	Wilcox		National	Jacksonville	Mar. 30, 1911
10	8:03.67	Merz		National	Jacksonville	Mar. 29, 1911

STRAIGHTAWAY RECORDS, CLASS "C" NON-STOCK

(Piston Displacement) STRAIGHTAWAY RECORDS, REGARDLESS OF CLASS, STOCK STRAIGHTAWAY RECORDS, REGARDLESS OF CLASS, NON-STOCK

10	5:14.40	Bruce-Brown	Benz	Daytona	Mar. 24, 1909
20	13:11.92	Burman	Buick Bug	Jacksonville	Mar. 30, 1911
50	35:52.31	Burman	Buick Bug	Jacksonville	Mar. 28, 1911
100	1:12:45.20	Berlin	Renault	Daytona	Mar. 6, 1908
150	1:55:18.00	Disbrow	Special	Jacksonville	Mar. 31, 1911
200	2:34:12.00	Disbrow	Special	Jacksonville	Mar. 31, 1911
250	3:14:55.00	Disbrow	Special	Jacksonville	Mar. 31, 1911
300	3:53:33.50	Disbrow	Special	Jacksonville	Mar. 31, 1916

HOURLY RECORDS

SPEEDWAY, REGARDLESS OF CLASS, NON-STOCK

Hrs.	Miles	Driver	Car	Place	Date
1	74	Harroun	Marmon	Los Angeles	April 16, 1910
2	148	Harroun	Marmon	Los Angeles	April 16, 1910
24	1,491	Verbeck & Hirsh	Fiat	Los Angeles	April 8, 1910

24	1,196	Patschke & Mulford	Lozier	Brighton Beach	Oct. 15, 1909
----	-------	--------------------	--------	----------------	---------------

ONE MILE CIRCULAR DIRT TRACK, REGARDLESS OF CLASS, NON-STOCK

24	1,253	Poole & Patschke	Stearns	Brighton Beach	Aug. 19, 1910
----	-------	------------------	---------	----------------	---------------

STRAIGHTAWAY, REGARDLESS OF CLASS, NON-STOCK

1	81.65	Disbrow	Special	Jacksonville	Mar. 28, 1911
---	-------	---------	---------	--------------	---------------

Gas Continues Soaring

Higher Scale of Prices Becomes Evident in Many Sections Throughout Country

Both Standard Oil and Independents Boost Cost to Consumer

CHICAGO, Jan. 15—Prices of gasoline throughout the country are gradually being adjusted to the higher scale started the first of the year by the Standard Oil Co., and the independents. The prices last week embraced such territories as Pittsburgh, Oklahoma, Alabama and Mississippi, New Mexico, Arkansas and Louisiana. The Atlantic Refining Co., increased gasoline prices at Pittsburgh as follows: Regular grade to 25 cents, 68-70 degrees to 28 cents, 73-76 degree to 32 cents a gal. Previous prices for the three grades were 25, 27 to 29 cents respectively.

Advances made by the Texas Company in the following states, were uniformly 1 cent a gal., the new prices being: Oklahoma, 22 cents, Alabama maximum 26, minimum 22½ cents, Mississippi maximum 23½, minimum 21½. Kerosene has been advanced ½ cent a gal. in New Mexico. This company has advanced prices in Arkansas and Louisiana 2½ cents a gal., the maximum and minimum prices in these states now being: Arkansas 23½ and 23, Louisiana 23 and 21 cents.

FOREIGN MARKETS FOR CARS

New York, Jan. 13—At a meeting of the export managers of the National Automobile Chamber of Commerce held here yesterday, possibilities of developing the foreign market for American-made cars were discussed and reasons were pointed out why American manufacturers should interest themselves to a greater extent in foreign trade. One of the most important reasons advanced is the scope of the foreign market and the fact that people in foreign countries are looking with much more favor on American-made cars than ever before. It is said that outside of the principal producing countries—that is, France, Germany, Italy and Great Britain—there are \$60,000,000 worth of cars imported every year. In the last normal year before the outbreak of the war France exported approximately \$45,000,000 worth of cars; Germany, \$20,000,000; Great Britain, \$15,000,000 and Italy, \$5,000,000, while in the same year, 1913, this country exported \$27,000,000 worth of cars.

COMPILES COMPETITIVE RECORDS

New York, Jan. 15—The American Automobile Association has issued a chart showing the competitive records of stock and non-stock cars on track and speedway, as well as hour and straightaway records as shown on this and the preceding page.



Dog drives motor car in Fifth avenue. "Poughkeepsie Rex," a large Scotch collie, attired in a chauffeur's cap and goggles and with a curved stem pipe in his teeth, recently drove an eight-cylinder Scripps-Booth roadster up Fifth avenue from Fifty-seventh street to Mount Morris Park, New York. By Rex's side sat his owner, J. K. Weed, Poughkeepsie, who kept his hand within quick reach of the wheel. Long practice enabled the dog to maintain an even course and even to follow moderate curves of the road without assistance. "Poughkeepsie Rex" is the celebrated dog that has already made something of a name for himself movies, and if present plans mature he may be assigned to drive a car across the continent.

CHICAGO, Jan. 16—Nine thousand five hundred dollars is the chassis price of the Fageol six-cylinder car to be first exhibited to the public at the Chicago show. The show chassis is now at the C. P. Kimball Co. shops in this city having a custom-built speedster body fitted.

This ultra-priced car is powered with a Hall-Scott six-cylinder aviation motor, rated at 125 to 150 hp. It is Bosch equipped throughout with starting and lighting units and the magneto of this make. The rear axle is a Kardo.

The car is unusually low hung. The gearset and motor consume about three-quarters of the length of the car and the connection from the gearset to the rear axle is a short shaft and universal with very nearly straight-line drive. Light weight is a factor throughout. The dash is a sheet aluminum plate carrying the instruments.

Exteriorly the show car is thoroughly distinctive. The radiator section is wedge-shaped with the narrow part at the top and an exceptionally large cooling area presented in front. The body on this car is a masterly Kimball four-passenger job.

FAGEOL TRUCK DESIGN COMPLETE

Detroit, Jan. 13—Designs for the two-ton truck to be manufactured by the Fageol Motors Co., Oakland, Cal., have been completed by Cornelius T. Myers, consulting

Coming—\$9,500 Chassis

Fageol Six with Powerful Aviation Motor to Appear at Chicago Show—Tradelights of a Week in the Industry

engineer, this city. L. H. Bill, formerly general manager of the Thomas B. Jeffery Co., Kenosha, Wis., is president of the Fageol concern.

The truck will have a 3¾ or 4¼ by 5¾-in. Waukesha engine—the size not yet being definitely determined—Gill tube type of radiator, unit powerplant, worm drive and Timken axles. The gasoline tank is under the seat and the hood has special ventilating openings in the top. The channel frame is bent in the front to protect the radiator. Grease has been eliminated as a lubricant and instead of grease cups, oil cups having thumb nuts with wick feeds are used. These are large enough to hold a half pint of oil. The engine is suspended at three points. The wheelbase is 144 in.

One of the features of the truck is that it is simple to take apart and each part can be removed without removal of others. For example, the steering gear can be removed without disturbing the engine or the engine can be removed without disturbing the steering gear.

GIVES ADDITIONAL TIRE GUARANTEE

New York, Jan. 13—An additional guarantee of 1500 miles of any standard make of tire is offered by James C. Nichols, Inc., handling the Dann Insert in New York, on all cars equipped with the Dann Insert. The cars already equipped with this insert before an announcement of this guarantee are covered.

DEVELOP MAGNETIC KNIGHT

New York, Jan. 13—A car in which the three features of a Knight engine, Entz magnetic transmission and worm drive are combined is being developed in this city by Watson & Stoekle, 351 West Fifty-seventh street. It will be called the Knight

Price Increases

FLINT, Mich., Jan. 12—The Chevrolet Motor Co., has increased the prices of its products. The 4-90 is now \$550, an increase of \$50; the eight-cylinder model is \$1,385, which is \$285 more than was originally planned.

CHANGE IN CHALMERS PRICES

Detroit, Jan. 9—The Chalmers Motor Co. has increased prices for its roadster and five-passenger models to take effect March 1. The roadster will advance from \$1,070 to \$1,250, and the five-passenger from \$1,090 to \$1,250.

Special and the chassis will be sold at approximately \$4,000 or will be equipped with a custom body to suit the purchaser.

The engine used is the Moline-Knight four-cylinder 4 by 6. One of the other features is the rear suspension consisting of unusually long cantilevers — 61 in. There are no levers visible in the driver's compartment, the gearshift, of course, being replaced by the Entz controller and the emergency brake being pedal-operated. The wheelbase is 132 in. Leather universals are used and Timken axle. One car has been built and plans are going forward for a moderate production this year.

REO CAR DESCRIPTION

In the Jan. 4th issue of MOTOR AGE in the short description of the Reo four-cylinder car for 1917 production, the points as regards changes over the 1916 model applied to the six-cylinder car instead of the four. Contrary to the information given in the article the Reo four does not have the new body and other changes which were described.

CONTROLS GEARLESS DIFFERENTIAL

Chicago, Jan. 15—The Bailey Non-Stall Differential Corp., has taken over the patents and manufacturing equipment of the Gearless Differential Co., Detroit, Mich., and plans for an extensive sales and advertising campaign have been perfected. Officers of the company are, R. D. Small, president; George D. Bailey, vice-president; M. H. Needham, formerly with Nash Motors, general manager and treasurer, and C. F. Ferguson, secretary.

LE ROI BUYS ENGINE PLANT

Milwaukee, Wis., Jan. 13—The LeRoi Co., incorporated under the laws of Wisconsin with a capital stock of \$350,000, has taken over the plant and the gasoline engine business established several years ago by the Milwaukee Machine Tool Co., Milwaukee, and will devote its attention exclusively to the manufacture of four- and six-cylinder motors for passenger cars, light commercial cars and light tractors. The name of the new concern is the trade name "LeRoi" adopted by the machine tool company for its engines when it first engaged in this line of production.

Officers of the company are: President and general manager, Charles W. Pendock; vice-president, J. Roy Frantz; secretary and treasurer, Norman Christiansen. Mr. Pendock is a well-known British engineer and designer, who was associated with several large motor car manufacturers in

England until 1910, when he came to America to join a large machine tool company at Cleveland, O., as chief engineer and designer. Three years ago he came to Milwaukee as chief engineer, designer, and general manager of the Milwaukee Machine Tool Co. He is responsible for the design of the LeRoi motor.

It also is announced that the company has made ready for the market a six-cylinder type in addition to the line of four-cylinder engines already manufactured. The new design is essentially a passenger car type and has cylinder dimensions of $3\frac{1}{8}$ by 5 in. The four-cylinder types are $3\frac{1}{8}$ by $4\frac{1}{2}$ in., $2\frac{7}{8}$ by 4 in. and $2\frac{1}{2}$ by $3\frac{1}{2}$ in. For the present all available capacity will be occupied in filling orders for these four motor types.

Among the larger manufacturers who have contracted for LeRoi motors are: Denbq Motor Truck Co., Detroit; Day-Elders Motors Corp., Newark, N. J.; Selden Motor Vehicle Co., Rochester, N. Y., and the New Era Engineering Co., Joliet, Ill.

WILLIAMS DESIGNS TWO-CYCLE

Waukegan, Ill., Jan. 15—A two-cycle motor of unusual design is the product of the recently organized Williams Motor Co., of this city. The motor is capable of firing perfectly on all cylinders at a speed as low

Lady Iris Campbell, daughter of the Earl and Countess of Essex, works eight hours daily as a chauffeur distributing food among the destitute in England



as 100 r.p.m. Because of this feature the makers claim that the greatest objection to two-cycle motors is surmounted.

The efficiency of this new motor is derived by the use of what might be termed a pneumatic plunger which functions for two of the cylinders. This plunger is forced back and forth by the compression from each cylinder consecutively giving a clean exhaust of gases through ports in the plunger and allowing a clean entry of injected gas. Thus the incoming and outgoing charges are distinctly separated which is not the case with ordinary two-cycle motors. The plunger stops against a pneu-

matic cushion at each end of its stroke across the top of the two cylinders. Quiet action is insured by this principle.

A set of cylinder heads embodying the Williams two-cycle mechanism is being applied to an Amplex car in the shops in this city. This reconstructed two-cycle car will appear on the streets of Chicago during the show. The motor will be manufactured on an extensive scale for marine, motor car and airplane use. The new principle is the invention of T. F. Williams with the collaboration of Charles R. Dost, both long identified with motor designing in this country and abroad.

Warner Heavy Duty Trailer Reversible

TRAILERS of 7-ton capacity are a part of the new line of heavy duty four wheelers built by the Warner Mfg. Co., Beloit, Wis. Other models of the same type are furnished in $1\frac{1}{2}$ -, $2\frac{1}{2}$ - and 5-ton capacity.

The most notable feature in these huge new trailers is the Warner hitch which has been a part of the two-wheel trailers built by this concern for some time. The hitch bar fastens over a ball to be attached to the rear end of the truck in a self-locking manner, forming a universal joint which

provides for a safe and flexible connection with the truck.

This hitch bar, which is carefully machined, fits with its other end over the locking end of the drawbar. This enables the truck driver to lay the connecting bar upon the drawbar, back up his truck and thus connect motor car hitch without the assistance of an additional man.

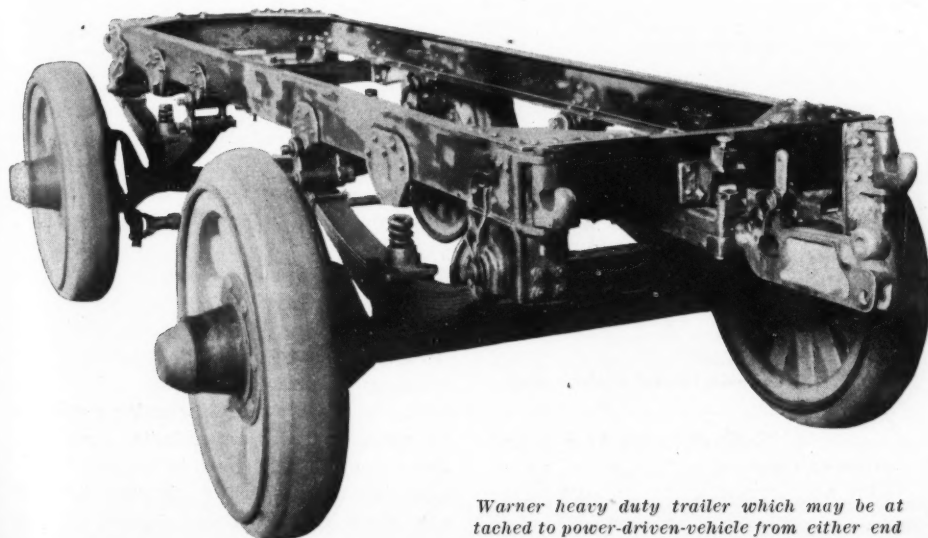
The drawbar by means of a hinged yoke, oscillates over the tie-rod yoke forming a universal joint, thereby making the steering mechanism entirely independent from

the frame. This arrangement is surely a feature for tire economy. The wheels will, under all conditions, remain parallel to the line of traction without wobbling or side motion.

These trailers may be obtained in the reversible form, that is, they can be operated from either end. A striking advantage in this construction is that in operation the trailer may be run in and out of narrow places that do not permit of free operation of the truck when drawn in one direction only. The trailer can describe an S that is twice a half circle of 180 deg. in opposite direction, within a distance of four times its own length, and can be backed in or out of alleys, doors, etc., sufficiently wide to permit its passage and in other difficult places between freight cars, loading platforms, etc.

BAUM HEADS EMPIRE RUBBER

New York, Jan. 16—Special telegram—J. E. Baum has succeeded C. E. Murray as president of the Empire Rubber and Tire Co., Trenton, N. J. Baum is a director of the Corn Exchange bank, New York, and president of the Supplee-Biddle Hardware Co., Philadelphia. Murray retains his interest and remains a member of the board of directors, and C. E. Murray, Jr., is vice-president and J. C. Murray is treasurer of the new company.



Warner heavy duty trailer which may be attached to power-driven vehicle from either end

What Constitutes Practical Direction or Traffic Signals

SEATTLE, Wash.—Editor MOTOR AGE—That the day has arrived, or is fast approaching, when we must definitely determine just what are proper and practical direction signals for motor vehicles is evidenced by the tendency, national in its scope, to enact laws relating thereto, one of which was recently approved and passed at St. Louis, Mo., the text of which was published in MOTOR AGE, December 28, 1916.

From a perusal of this ordinance it would appear that certain of its provisions were drafted by an individual interested, directly, or indirectly, in the sale of a signaling device having features that measured up to the particular requirements of those provisions, with no thought having been given to the possible dangers and legal complications likely to arise through their enforcement.

This article is written not only as an attack on those provisions, but is directed against further legislation of this sort, until it has been determined just what are practical direction signals, and a standard adopted.

Desires Universal Signals

Be it understood, there is no ulterior motive for my statements. I am not in any way interested in, or connected with a signaling device. I was recently the victim of an accident that nearly cost me my life, caused by the direction signals—or lack of them—in vogue to-day. My interest in the matter, therefore, starts and stops in a desire to see the universal adoption of signals that will in the future tend to make more secure my own neck, and that of those about me.

Section 1335 of the ordinance approved by the council of St. Louis provides that a "slow" and "stop" signal shall be displayed at the rear of a vehicle when a stop is contemplated, and until the vehicle has ceased its forward movement. It needs but little consideration to perceive that not only are such signals unnecessary, but they are a positive menace. They are neither safe nor sane and they are an out and out discredit to those who fathered them.

When a car makes a turn, be it to the right or to the left, it breaks into the course of pedestrians and other traffic, and it is to the advantage of all that the driver of such car make known his intentions in advance, but when a stop is contemplated the vehicle is directed out of the course of all traffic, to the curb, whereupon it has ceased to be a source of danger.

Suppose an operator of a vehicle, traveling at a speed just within the limit, is

suddenly confronted with the alternative of displaying in turn a "slow" and "stop" signal or running down a pedestrian. If he chooses to obey the ordinance and remain secure with the law, the obstacle in his path must be crushed. If he considers the life, and jams his brakes, the driver behind, secure in the fact that a "stop" signal has not been displayed, runs him down. The pedestrian is unharmed, by reason of which an ordinance has been violated, and the violator is obliged to suffer the damages done himself, as well as that to those following. Life is made less important to the operator than the displaying of a signal!

Do such signals tend to further the interest of safety?

The very nature of the direction or traffic signal problem necessitates a thorough and careful analysis of the conditions to be met before there can be a practical application. If I correctly understand the policy of MOTOR AGE, its columns are open to an intelligent discussion, and an exchange of views on the subject. These are my contentions as to what are necessary signals. To begin at its source, grouping questions and answers, they follow:

Is there any present need for any kind of signals?

Yes.

Why?

Congested streets, traffic regulation, danger alike to operators of vehicles and pedestrians.

Is a mechanical signal to be preferred to indication by movement of arm?

Yes.

Why?

Signals limited to those devices capable of performing; less confusion; closed or curtained cars; manipulation without removing hands from wheel; easier to standardize.

What movement of vehicle should signal be capable of indicating?

Straight ahead, right turn and left turn.

Why?

None other necessary.

Where should signal device be attached?

Left rear fender; in line of vision of driver behind, and right front fender.

Why?

Greatest vision angle for traffic officer.

Should means of indication be by word or pointed?

Pointer.

Why?

Eye catches with less effort; brain more quick to translate.

Should indicator be interior or exterior, i. e., operate out of casing or in casing behind transparent material?

Exterior.

Why?

If interior, indication would be obscured on car having traveled on dusty road.

How operated? Why?

Electric. Applicable to any modern car.

How far visible?

50 to 100 feet.

Should it be automatic or operated at will?

Operated at will.

Why?

Signal to be of avail must be given in advance.

I am not going to insist that a signaling device will be ineffective, and that it will fail in its purpose unless it measures up to all of the requirements herein set forth, but I do insist, and I firmly believe that the apparatus that will ultimately come into general use, will in the main, embody the features which I have suggested.

Inasmuch as no extensive action has yet been taken pertaining to laws governing signals, it occurs to me that here would be the logical place for MOTOR AGE and other supporters of the movement for standardization of traffic rules, to insert a most effective wedge. It would be much easier to set a standard for signals at this time than at a later date, when fifty-seven varieties will have been placed in use.

I would suggest that inventors and producers of signal apparatus be prevailed upon to submit their products to a standardization board, to be comprised of car manufacturers, safety first league officials, traffic officials, etc., through and out of whose investigations there would emerge a standard, and a survival of the fittest.—M. E. Ash.

PUBLIC SQUARE FOR TRAFFIC

Trenton, N. J., Jan. 15—To relieve the congestion of traffic, City Commissioner George B. LaBarre is advocating that the city create a great public square in the heart of the downtown district by purchasing and tearing down a number of buildings. The improvement would cost upward of \$1,000,000. A municipal cab stand, trolley terminal, public comfort stations, etc., would be features.

MAY LIMIT TEXAS SPEED

Austin, Tex. Jan. 13—Gov. James E. Ferguson in his biennial message to the legislature, which convened Jan. 9, recommends that a stop be put to speeding. He says:

"In order that the general public may enjoy the use of the highways with reasonable safety, I am in favor of making it a jail penalty to run a motor car in any incorporated town more than 10 miles an hour or more than 24 miles an hour on a country road. There is an imperative demand that the speed maniac be dealt with in some drastic way."

In this message he gives his official endorsement to the plan of passing a law creating a state highway commission. There is a unity of effort being expended to get a highway commission for Texas that the state may share in the federal aid given to states with a highway body to administer the funds.

With Ambition to Make Useful Things

Charles W. Stiger

By Ruth Sanders

PERHAPS he sat on a fence and whittled as he dreamed—that boy of thirty-odd years ago. The dream was of a self-propelled machine such as never had been seen before. The boy's world contained no satisfactory means of comparison, and the dream had imaginary form as a hybrid of an old-fashioned photograph car, then staring at the fairs, and a sandwich car. Since those days the boy's dream has become tangible. A remarkable industry has arisen to produce the dream car, with all the refinements that other dreams have made possible. And the boy, now grown, is dreaming with firm faith of an even more remarkable industry.

It was the same boy who bought the old, dog-eared copy of "Les Miserables" which was cast out by the library in the small town which gave him birthplace, paying the right royal sum of 25 cents. The book had no covers and no doubt was dim with handling, but even to-day the boy regrets that he finally lost it.

Trys Out Devices Himself

The Charles W. Stiger one finds at the head of the Motor and Accessory Manufacturers' Association and as president in active charge of the Stromberg Motor Devices Co. has not forgotten the boy he once was and his dreams. The dream car still gives him his greatest pleasure. He says that after all is said and done nothing takes the place of his motor car. Nobody takes his place at the wheel of that motor car he calls his own either, for he makes almost constant use of that about which the boy dreamed so long. The new model gets a try-out on Mr. Stiger's car.

"If it suits me I'm pretty well satisfied that it's going to suit the public," he says.

Each year Mr. Stiger's car takes him back to visit his mother at Bucyrus, Ohio, where he first dreamed of the strange machine and where he first read of Jean Valjean in the discarded library book. It has been thirty-two years since he left Bucyrus to "make useful things." For three years or so he was night manager of the Chicago Telephone Co. Then he went to Streator, Ill., where he built a light plant while manager of the exchange there. When he came back to Chicago he organized the West Chicago Light & Power Co., which furnished all electricity west of Ashland avenue. He was president of this company until 1897, when he sold it to the Commonwealth Edison Co.

After a year of traveling he went back to the telephone business as general manager for the Stromberg-Carlson Telephone Mfg. Co., maker of switchboards and tele-



President of the M. & A. M. and of the Stromberg Motor Devices Co., Chicago.

phones. Rochester, N. Y., interests bought the concern in 1905, and thus ended the first two episodes of his business life, the telephone and the electric light. But he likes to remember that he attended the first national electric light convention in the United States. The electric light industry was then what the motor car industry is to-day.

One of the first eight cars that came to Chicago in 1901 was Mr. Stiger's, and he had a second of the ten or fifteen in 1903. This second was an improvement on the first, but the experimental stage was still new. The carburetor was the greatest difficulty. Associated with Mr. Stiger at this time were Alfred Stromberg, Andrew Carlson and Charles A. Brown, and these four men agreed to back experiments for an efficient carburetor. The first carburetor evolved had a glass float chamber. In a year or so this chamber was all that remained of the old, and meanwhile Mr. Stiger had worn out two cars in the cause.

Finally the experiments justified the organization of a company to make the carburetor. This was in 1907. Nine thou-

sand were made the first year; 200,000 in 1916. In January, 1908, the business amounted to \$131; in 1916 to nearly \$1,500,000.

It is interesting to notice that while Mr. Stiger was building and running electric light plants he was studying electrical engineering. He went to the Bucyrus high school and spent a year at the state university at Columbus, Ohio. His electrical engineering education, however, was obtained through the International Correspondence School. He is one of the original members of the Society of Automobile Engineers, belongs to the Engineering Club of New York and the Union League Club of Chicago, as well as the Chicago Automobile Club and the Oak Park Country Club.

Finds His Sphere

Just as the boy who dreamed had a desire to create so does the man grown have that desire. He tried other things. It took him just four months to learn he could not "make useful things" selling goods for the small wholesale concern he worked for when he first came to Chicago. He sold thirty encyclopedias and found himself with the thirty-first as a souvenir. He wanted to create, "to make useful things," as he expresses it, and he tried with all his might to find that which would give his ability the most opportunity to create. He found it in electrical engineering.

Mr. Stiger was elected to the board of directors of the M. & A. M. in 1913. He was first vice-president and chairman of the finance committee in October, 1916, when he was elected president to fill the vacancy left by the resignation of F. Hallett Lovell, Jr. As to plans for the coming year of his presidency he has little to say, other than that these plans are tentative. He looks forward to an enlarged scope for the credit department in particular. Last year this department furnished 138,540 reports on ratings, an increase of 16,652 over 1915. He tells with pride that in thirteen years the organization has grown from thirty-seven members to 263 and has become a member of the United States Chamber of Commerce.

He insists that he gets the most fun out of his work, and it must be so, for 8.30 finds him at his desk unless the unusual prevents, and he is not due to leave before 5.30. It may be that interest helps make fun for him there. He is interested in the workers about him and in visitors. Anybody can get into his office at any time. The operator at the switchboard understands that the least important visitor has a chance to see Mr. Stiger.

Headlight Glare Clearly Defined

Methods of Bringing About Better Illuminating with Minimum of Dazzle Told by Testing Laboratories Expert

NEW YORK, Jan. 11—Definite classification of the methods of removing the ill effect of headlight glare has resulted from a meeting of the representatives of all the interests affected last night under the auspices of the Society of Illuminating Engineers.

The discussion was started by a paper by F. W. Little of the Electrical Testing Laboratories, entitled "A Survey of the Automobile Headlight Situation." In connection with the paper a number of the

leading devices on the market were demonstrated by actual illumination, after which the meeting was opened to a discussion by authorities representing the different classes interested in headlight glare. Those who spoke were as follows: Dr. Louis Bell, consulting engineer; Hon. W. L. Bill, commissioner of licenses, State of New Jersey; Deputy Commissioner L. B. Dunham, Police Department, New York; Dr. H. P. Page, Corning Glass Wks., Corning, N. Y.; James Hemstreet, American Automobile Assn.;

A. L. McMurty, Society of Automobile Engineers; Dr. C. H. Sharp, Electrical Testing Laboratories, and Prof. C. W. Waggoner, West Virginia University.

The paper by Mr. Little was really a classification and a definition of the construction and operation of headlights. The author states that:

The main problem in headlight design is that of applying the light effectively for driving purposes without producing glare. The angle which separates this useful light upon the roadway from that which would produce glare is very small. Also assuming that it is possible and practicable to keep all of the light below a plane passing through the headlight axis, the inequalities in the roadbed would cause this plane to shift to the extent of producing glare when the headlights point upward, and producing but little useful light when they point downward. A balance should be secured between objectionable glare on the one hand and useful driving light on the other.

Requirements

In order to obtain opinions concerning the requirements for headlight design, questions were sent to a number of men who have given thought to the subject.

A number of "non-glare" headlight devices have been developed. The principles upon which these depend may be classified as follows:

1. By dimming the light.
2. By diffusing the light.
3. By cutting off the disturbing light.
4. By re-direction of the light.
5. By special type of reflector.
6. By change in the color of the light.
7. By tilting the reflector.

Several of the devices available make use of two or more of these principles. The first and simpler principle is the mere dimming of the lights by means of a rheostat or by throwing the two incandescent lamps in series without changing the light distribution. As the beam candlepower is directly proportional to the brightness of the course, the reduction of the beam of this method of avoiding glare would be followed by a similar decrease of light upon the roadway.

The second principle, that of reducing the brightness of the beam by diffusion, is applied in the form of a diffusing front glass either clear or frosted. Any degree of diffusion required may thus be obtained. The diffusion has the effect of reducing the beam intensity and contributing the light so gained to the illumination of objects contained within a much wider angle.

The third principle, that of cutting out portions of the beam, depends on the fact that if the front end of the lamp filament is placed at the front of the reflector, the divergence of the beam reflected from the top of the reflector will all be above the horizontal, while that from the bottom will all be below the horizontal or axis of the reflector. Hence, if no reflected light from the upper half is allowed to emerge, all the light of the headlight will be along the axis and below it. This may be done by a blind over the top half of the glass front or by a cap over the top of the lamp bulb. This elimination, of course, reduces the beam candlepower and total flux to an extent which in many instances amounts to one-half or more. A variation is made upon this method in some cases by frosting rather than rendering opaque the upper half of the reflector or lamp. Opaque caps covering the upper half of the lamp bulb, when black, will accomplish the same purpose as eliminating half of the reflector. If the opaque cap has a reflecting interior surface, the available flux impinging at the lower surface of the reflector is greatly increased, but the efficiency is still less than that of the same unit not so equipped.

The fourth principle, that of the reduction of light above the horizontal by re-direction is applied principally by the use of prismatic glass fronts which tend to re-direct all reflected light or by prisms surrounding the lower portion of the bulb.

The fifth principle involves the use of a split reflector having its upper and lower halves of different focal length or having the foci separated by the filament length.

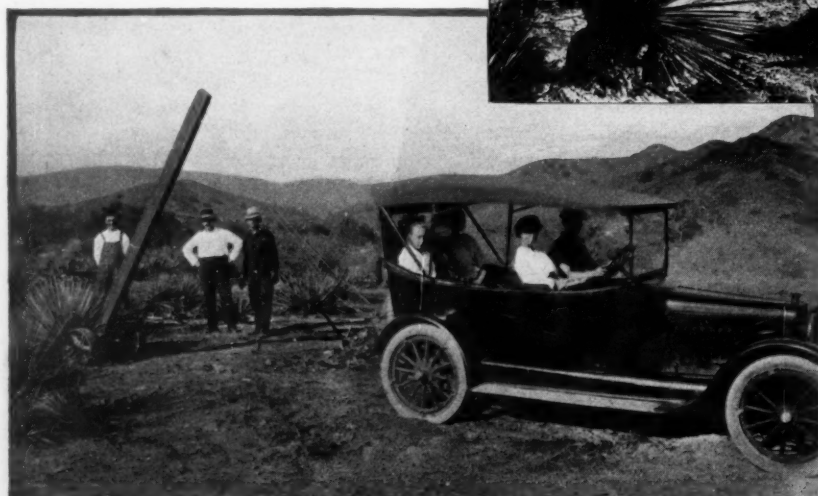
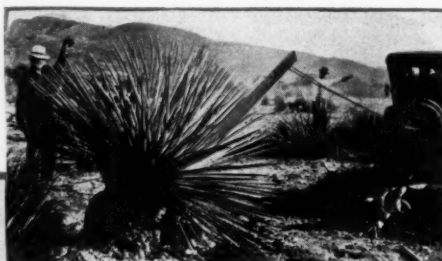
How One Car Earns Its Keep

California Owner Tries Hitching Machine to Stump Puller

THAT there is at least one way of making the family motor car earn its keep may be seen by the accompanying illustrations. The touring car, which is of the Saxon family, may be seen here assisting materially in the clearing of a 6-acre piece of land. When uncleared this land was covered by a dense growth of brush, cactus, yucca, etc. The ordinary type of brush was cleared by the fire process, but the yucca, mesquite and cactus refused to be removed in this manner. Several methods were tried in the effort to remove these obstacles, but all failed, and the owner was about to resort to the use of gunpowder when the happy thought of making use of the family touring car came.

J. M. Kimball, owner of the land near San Fernando, Cal., constructed the device by which the stumps were easily removed. It consists of a 14-ft. beam, which is braced upright on a two-wheeled truck.

A steel claw is fastened to the lower end of the beam and a steel cable runs between the upper end of the beam and the motor car. When Mr. Kimball desires to remove an obstacle he simply rolls his stump puller up to one of the large cactus or yucca and forces the steel claws down among the roots, passing a chain around the stump to keep it from sliding off the steel prongs. The signal to go ahead then is given, and the motor car gradually moves ahead. The top of the pole is pulled downward, and the steel prongs are forced upward, tearing the stump from the ground and lifting it clear of the earth. After this the stump is carried on the truck to the burning pile a few yards away.



The sixth principle, that of reduction in apparent brightness and reduction in glare, by the change in color of light, is accomplished either by using a colored glass reflector or colored glass front and in some cases a colored glass bulb. It is asserted that a yellow beam of light will produce less glare and penetrate a fog better than the same intensity beam of unmodified light.

The seventh principle, that of tilting the headlights downward to the point where very little reflected light is above the horizontal, is a simple expedient and in many cases would probably result in quite as effectual glare remedy as many other devices employed. This expedient is not looked upon with favor by the law makers, in spite of the fact that a well-designed headlight pointed downward at an angle of 3 deg. the maximum would strike a level roadway 70 ft. in front of the car and the reflected light at the horizontal would be less than 40 per cent of the beam intensity, while 1 deg. above for the reflected light would be about 15 per cent of the maximum. In many of the devices now in use the cut-off between the maximum and horizontal is not as good as the figures just shown.

It is interesting to note that in spite of the use of almost any device modifying the natural light distribution from the motor car headlight, an opposing driver will invariably allow his headlights to burn full intensity without modification unless one's own headlights are dimmed in passing.

The several devices available for reducing glare may be classified as

1. Control of light between the source and reflector.
2. Control of light by the reflector.
3. Control of light after leaving the reflector.

The first class includes coloring, frosting or otherwise changing the surface of the bulb; and the use of caps and primes.

The second class involves varying the contours and forms of the reflectors.

The third class involves the use of glass fronts made in the various forms, and of blinds. The various glass fronts used to control the reflected light may be divided into two classes: The prismatic and the diffusing.

The discussion was conducted by L. B. Marks, past president of the Illuminating Engineers' Society. He spoke of the importance of this problem because of the great variety of legislation. He stated that in order to conform with the law a man may have to change the headlight glass in his car six times in driving 1000 miles. He cited a few examples of legislation which showed the rather confused state of the legal side of the question.

Compromise Necessary

Dr. Bell stated that the matter must be a compromise between the cutting off of light and the elimination of glare. He said that as far as a single glare eliminator is concerned, perfection is obtained by a simple disk of newspaper, the only trouble being that it also removes the illumination. It must be a compromise between extreme confusion and extreme concentration of the reflected ray. Another point brought out by Dr. Bell is that in the cutoff type of headlamp glare reducer, the focusing of the light is of extreme importance.

A. L. McMurtry, who is a member of the Standards Committee of the S. A. E., said that a solution of the problem will never be had until appearance and price cease to be the main requirements in headlight selection by the motor car manufacturer. Furthermore, he stated that there will be no change in the situation until the laws governing headlight glare are enforced. Regarding the confusion which exists on the subject he said that it is small wonder that this is the case if one stops to think that it is not surprising to think that a police officer shall not

be able to find glare when the engineers have not been able to do so. He mentioned a device which had been brought out showing rather humorous side of the situation, which when held in the hand of the operator indicated whether the light was glaring or not. He mentioned the fact also that it would not be advisable to give a preliminary report at this time on the activities of the S. A. E. Standards Committee.

Headlights vs. the Law

Sergeant Richey of the New York police force, representing Deputy Commissioner L. S. Dunham, stated that the New York police force has an open mind on the glare subject but so far has not seen a single headlamp which was effective for country illumination that really complied with the law. The same fact is borne out by the opinion of the London police. He states that in many instances where he has been

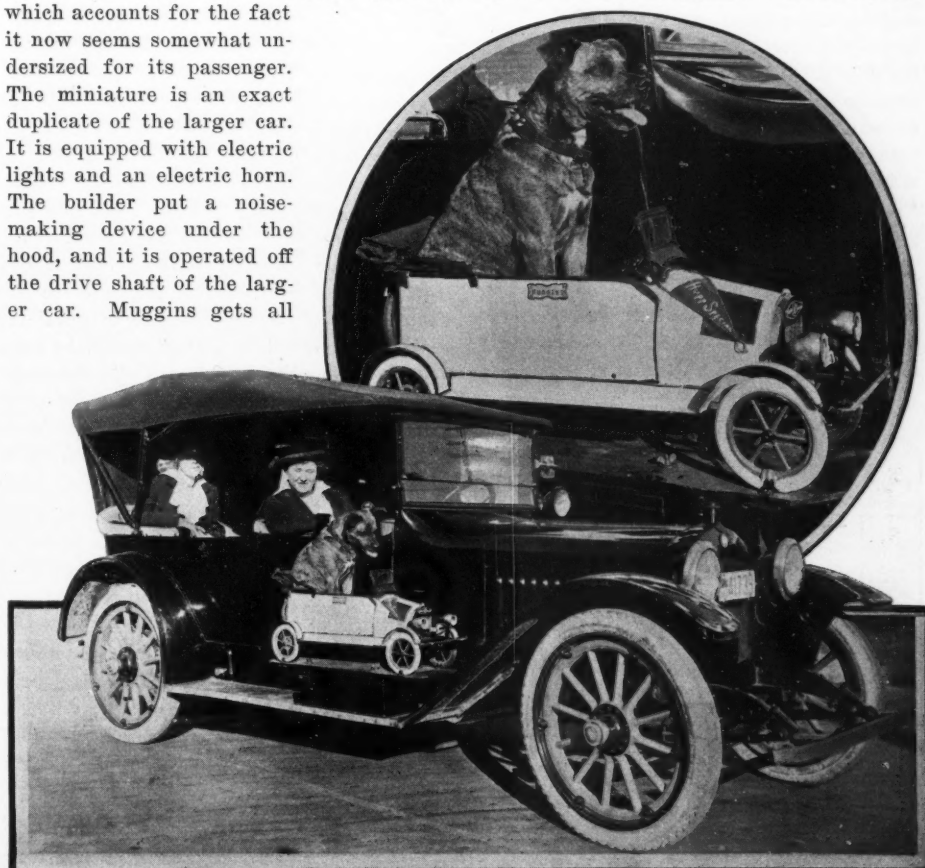
called upon to give decisions whether or not a headlight is glaring he has always decided against the headlight. He stated that the lamps giving the flat horizontal ray in which the height should not be more than 42 in. at 75 ft. was all right on flat roads, but on hills they were apt to be the contrary of correct. He also mentioned a variety of places where it would be impossible to see a pedestrian with the ordinary type of headlight and emphasized the importance of this by stating that there is one person killed on the streets of New York every 14 hr. and one injured every 23 min. Sergeant Richey said that the commissioner had requested him to call the attention of manufacturers to the fact that the tail lights in most instances did not comply with the New York State law which said that they should render the numbers legible at a distance of 50 ft. in the direction that the vehicle is traveling.

Canine Has a Car All His Own

Muggins Can Let the Traffic Officer Know He's Coming

MUGGINS, the canine friend of Mrs. C. C. Caister of Los Angeles, is probably the only dog that has a motor car exclusively his own. It is a miniature car attached to the battery box on the running board of his owner's Hupmobile. It was built for Muggins when he was several months younger, and the man who built it did not allow for the dog's growth, which accounts for the fact it now seems somewhat undersized for its passenger. The miniature is an exact duplicate of the larger car. It is equipped with electric lights and an electric horn. The builder put a noise-making device under the hood, and it is operated off the drive shaft of the larger car. Muggins gets all

the hum of pleasurable motoring that goes with the looks of a motor car. The lights are connected with those on the bigger car and operate simultaneously. It is next to impossible to induce the dog to leave his seat when the car is in motion, and it is a dangerous task for a stranger to attempt liberties when Mrs. Caister is not in her car and Muggins is left in charge.





Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.



Editor's Note—Herewith is presented the twenty-seventh installment of a weekly series of articles began in Motor Age issue of June 29, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., in a size to fit the pocket conveniently. It is expected that the book will be published about April 1.

Part XXVII—Electric Motors

IN the majority of cases the magnetic field of a motor is produced by electromagnets, though a magnetic field may be produced by powerful permanent horseshoe magnets. Small machines are usually bipolar, that is, they have one north pole and one south pole which create the magnetic field in which the armature rotates. These magnetic fields assume a number of different forms, three of which are shown in Figs. 170a, 170b and 170c.

The magnetic circuit of a motor whose magnetic field is created by electromagnets usually consists of five parts, Fig. 171, as follows: First, the field cores C are the parts about which the coils carrying the magnetizing current are wound. Second, the yoke Y connects the field cores together at the outer ends, as in the figure, and serves the double purpose of completing the magnetic circuit between the field cores and of providing the necessary mechanical supports for the cores. Some machines have no yoke in the magnetic circuit, Fig. 170a. Third, the pole pieces P are the parts of the magnetic circuit next to the armature. They usually are cut to conform to the armature. They may be formed by properly shaping the ends of the field cores, or they may be pieces of metal entirely different from the ends of the field cores, being fastened to the field cores by bolts. The surfaces of the pole pieces next to the armature are called the pole faces and the projecting edges, when so constructed, are called the pole tips. Fourth, the armature core A conducts the magnetic flux between air gaps and at the same time serves as a mechanical support for the armature winding. Fifth, the air gap G is the intervening space between the pole piece and the armature.

When the field windings are placed on the magnetic circuit as in Figs. 170b and 171, the magnetomotive force created by the current in one coil is in series with the magnetomotive force created by the current in some other coil, or the magnetomotive force on any magnetic circuit is that produced by the two coils in

series. If the field windings be placed on the magnetic circuit as in Figs. 170a and 170c, the magnetomotive force acting on any magnetic circuit will be equal to that produced by a single coil. When the field windings are as in Figs. 170b and 171 only half as many ampere turns per coil as would be required if the coils were placed as in Figs. 170a and 170c will be required, assuming the total reluctance in the two cases to be the same.

Materials Used in the Construction of the Magnetic Circuit of a Motor: Four materials commonly are used in the construction of the magnetic circuit of a motor, that is, wrought iron, cast iron, cast steel and sheet steel. Several factors govern the selection of the materials to be used in a particular machine, such as initial cost, weight, efficiency demanded by purchaser, etc.

The cheapest of these materials is cast iron, but its magnetic properties are poorer than those of any of the others, so the saving in the initial cost of the iron per pound might be more than overbalanced by the fact that a larger bulk of cast iron would be required to form a certain magnetic circuit than would be required if wrought iron, for example, were used. There also would be an increase in the cost of copper required to magnetize the magnetic circuit of large area, since the length of each turn would be more than if a better material were used or the area of the magnetic circuit were reduced.

Steel, on the other hand, is the best magnetic material and at the same time the most expensive. It is used where economy in weight and reduction in cross-section are desired. Machines used on electric motor cars, etc., are frequently made of cast or laminated steel on account of the large reduction in weight, which is a more important factor than the initial cost.

The magnetic circuits of motor cars are, as a rule, constructed of more than one material. Thus, the field cores may be of wrought iron, as that means a saving in copper since the length of the wire per turn would be less than if cast iron were used; the yoke may be of cast iron, as its area can be made larger than the field cores, and this increase in area will provide an ample magnetic circuit and also the mechanical strength necessary to support the field cores. The armature core usually is constructed of sheet metal

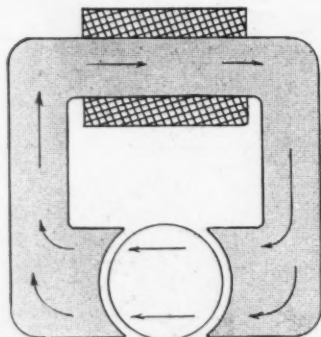


Fig. 170a—Bipolar magnetic field with single field coil. The magnetic circuit has no yoke as most types have

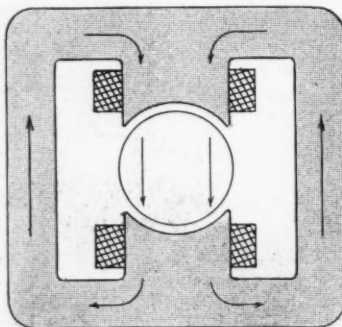


Fig. 170b—Bipolar magnetic field with two field coils. Here a yoke supports the field cores and completes the circuit

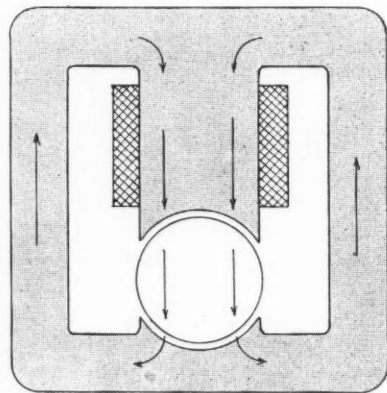


Fig. 170c—Another type of bipolar magnetic field with single field coil

to reduce the eddy-current loss to a minimum; the pole pieces may be a part of the field core and may be cast or laminated and bolted to the ends of the field cores.

Excitation of Direct-Current Motors

Direct-current motors may be divided into three classes according to the method employed in exciting the field magnets. These are: (a) Shunt motors; (b) series motors; and (c) compound motors.

(a) The field winding of a shunt motor consists of a relatively large number of turns of small wire connected directly across the terminals of the machine or the circuit to which the machine is connected. A rheostat may be connected in series with the field winding, which may be used in adjusting the value of the current, or no rheostat may be used at all, the field current being allowed

to vary with the voltage impressed across its terminals and the change in the resistance of the field winding, due to a change in its temperature. The connections of a shunt motor are shown diagrammatically in Fig. 172. The current in the field winding is independent of the current in the armature circuit as long as a change in armature current produces no change in the voltage impressed on the shunt field winding.

(b) In the series motor, the field winding consists of a relatively few turns of large wire connected directly in series with the armature, as shown diagrammatically in Fig. 173. The current in the field winding is the same as the current in the armature, and the strength of the magnetic field of the machine varies with the armature current. The field strength does not increase as rapidly as the current in the field winding, due to the fact that the reluctance of the magnetic circuit of the machine increases with an increase in the magnetic flux. In some cases a resistance is connected in parallel with the series field winding and only a part of the armature current passes through the field, the total current dividing inversely as the resistance of the two branches of the divided circuit.

(c) The field windings of a compound motor are a combination of the shunt and series windings, as shown diagrammatically in Figs. 174 and 175. The magnetic effects of these two windings may aid or oppose each other, depending on the manner in which they are connected. When the magnetizing actions of the series and shunt field windings act in the same direction about the magnetic circuit, the machine is called a cumulative compound motor; when the magnetizing actions of the series and shunt field windings are in opposite directions about the magnetic circuit, the machine is called a differential compound motor. In the case of the cumulative compound motor, the strength of the magnetic field increases with an increase in series field current, since the two magnetizing effects act together; in the case of the differential compound motor, the strength of the magnetic field decreases with an increase in series field current, since the two magnetizing effects act in opposite directions.

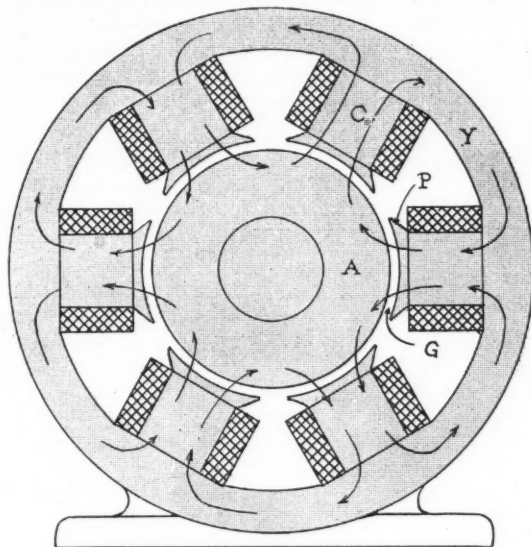


Fig. 171—This six-pole magnetic field is marked to show the different parts of the magnetic circuit

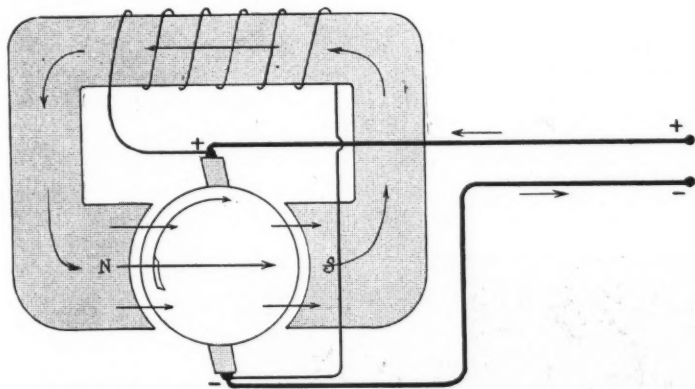


Fig. 172—A shunt field; the field winding is in parallel with the armature

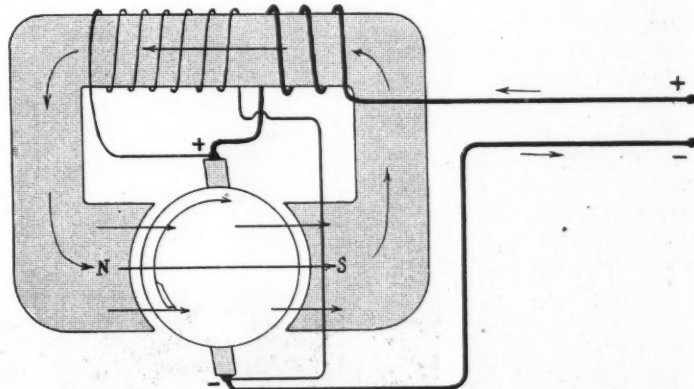


Fig. 174—A cumulative compound field in which the magnetizing action of the shunt and series field windings act in the same direction

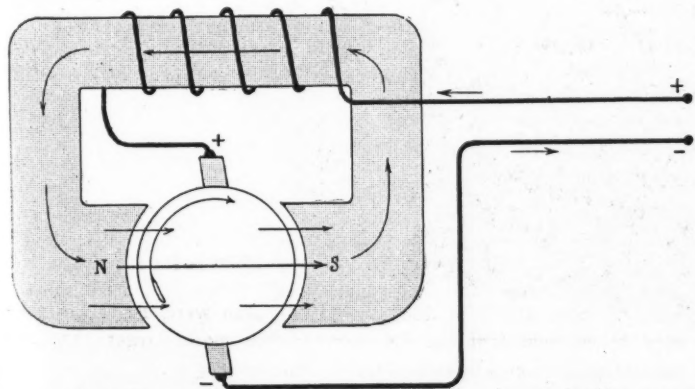


Fig. 173—A series field winding; the field winding is in series with the armature and outside circuit

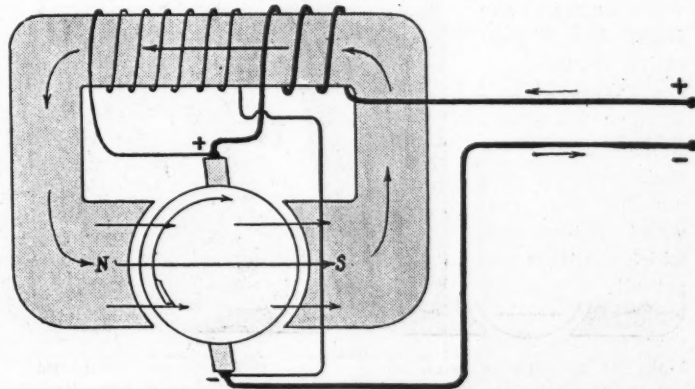


Fig. 175—A differential compound field in which the magnetizing actions of the shunt and series field windings are in opposite directions



From the Woman's Viewpoint



Taking the Rocking Chair to the Car

THOSE who sit in rocking chairs sometimes drive motor cars also. But what a difference some of them make between the two!

Suppose you sat in your rocking chair with your body tense, your breath catching at every swing of the rocker's pendulum, hands gripping the chair arms fiercely, feet giving little dabs at the floor to keep the motion. Suppose you shuddered as you saw one of the children come in the door to the side of the room and thought what if the child crosses the floor in front of you. Would you wonder if someone told you all this was unnecessary?

Yet, this is what some women do in driving a car. They never relax. Their hold on the steering wheel seemingly cannot be broken even with a crowbar. They work the accelerator spasmodically. Each occupant of the sidewalk, especially a child, is their prospective victim, and they condemn themselves prematurely.

Many Women Become Experts

Many women to-day drive cars so skillfully and so successfully that they are ranked as expert operators without hesitancy. Each season more women enter this class of drivers, and their proportion to the total number of drivers is more than might be thought. In Atlanta, Ga., for instance, one in every four cars that pass a certain point in the downtown district is driven by a woman, according to the traffic policemen, who have kept a count. If figures were available for all cities, the proportion no doubt would decrease little, for the general trend is for the woman of the South to let some masculine member of the family or chauffeur do the driving more often than the woman of the North has a masculine driver.

Probably there would be more women driving their cars if it were not for their natural nervousness, which has them perpetually crossing bridges before they come to them. They look for trouble more often than a man does, instead of preparing to

overcome any future trouble by learning their cars and determining to meet any ordinary difficulties that may arise.

It is to be expected that a woman who operates her car for the first time, whether she has learned in a haphazard manner or from an expert, doubts her ability somewhat. Even the best of them may do that. But when she persists in this doubt with perhaps no actual experience of other than a puncture, it is usually due to a lack of confidence.

Some are nervous when driving because they are nervous everywhere else, even in rocking chairs. In a way they fully believe the rocking chair will tip over backward sooner or later. They are like the man who took his first steamboat trip on the Mississippi. He couldn't sleep a wink for fear the boat would sink and he would know nothing about what had happened when he drowned. Someone asked him how he managed to keep awake.

"Oh, I never go to bed!" he said.

Some drivers never let their nerves, or fears, go to bed. This applies to men as well as to women, for the writer has known both genders to ride the rocking chair with dread as a companion. One man drove his car for several years with an eye out for mishaps. And he had them. He finally had to stop driving to ease the strain. A girl always had to have some expert along—just in case of emergency. Consequently, she never learned to confide in her own ability and he never learned to drive.

With what a difference do some women control their nervousness! There is in mind one who from the first turned a corner with what was apparently two movements of the steering wheel. She never wobbled nor did she turn in a reckless manner. Others recalled just now seemed to be shifting the wheel continually until the corner was turned and left far behind.

Do not judge from these paragraphs, however, that women drivers as a whole are noted for their lack of confidence. They are not, judging from several sources. Take the instance of the Atlanta, Ga., women. The same policemen who obtained the count of one woman driver in every fourth car also said that on the average women drivers are safer and better drivers than the men. If this is so, then it must be because they are able to develop confidence in driving, even though they start out with the full quota of the nervousness to which woman seems heir.

Luck Blamed Too Often

A woman's confidence in driving, it is said, depends a great deal on the luck she has in driving. Luck, however, has various definitions. It may be that the lucky woman knows, and remembers, that she must inspect the gasoline tank and radiator, even if the car generally is under the care of someone more fitted to mechanical inspection than she is. Though she may not know anything about the carburetor she may be able to mend a punctured tire, or do the simple repairs. And if she knows how to do the simple repairs it means that much more confidence in herself.

Luck sometimes means freedom from road trouble. But road trouble usually can be avoided by care before starting. If the driver is sure that the tires are in good condition; the car is well oiled; and the gasoline tank and radiator are filled, she has done much toward avoiding road trouble. And, naturally, the less road trouble, or the more luck, the more confidence.



This illustration pictures a unit of English women with their ambulances just before leaving for Red Cross work in Russia. They are trained to drive the ambulances and make the road repairs. Their uniform is much different from that usually associated with Red Cross work, but then the white-clad nurses of old did not have motor ambulances

We are told that the best way for a woman to learn to drive a car is to make up her mind not to learn to drive it at all but merely to run it. The theory is that if she doesn't have an ambition to really know her car's mechanical heart her mind will be that much freer to shifting gears, steering and so on. Now, there might be something in this, and there probably is more than appears on the surface. The same giver of free advice says that anybody can run a car as long as nothing gets the matter with it, but it takes more to drive a car. Our advice would be to start out on this hypothesis: Given a car to learn to run. Then, gradually, as you learn more about the car, become a driver capable of meeting all ordinary road trouble and of knowing when your car needs better attention than you can give it.

Acquaintance Hurries Confidence

To help hurry the coming confidence, get acquainted with your car as soon as possible, however. Respect its individuality and study it so you will not rub its fur the wrong way, so to speak. For the motorist and the car should be good friends and, as such, unwilling to ruffle the other. Sometimes you think your car is not as a friend should be—when you are stalled out on the road, for instance. But perhaps that stalling is more your fault than the car's. Acquaintance should make it possible to avoid such misunderstanding.

You might confine yourself to short runs and avoid heavy traffic at first. There is an almost certain likelihood that you will have the strain of fatigue as well as of lack of confidence to undergo if you try very long runs for a while after you first begin driving. You should get all the information possible about your car. No doubt you will have many ups and downs. That is like life, anyway. But forget you are a novice as soon as you can, and you will find yourself the owner of that much more confidence. But, by all means, try to have the same confidence as if you were at home quietly rocking. For it is possible to take the rocking chair to the car instead of bringing the car to the rocking chair.

Feminine Motor Notes

MRS. JOHN L. KIMBELL, director of the Jefferson Highway Association for the state of Louisiana, is the only woman holding a prominent position in highway work in the United States, it is said. The association credits her with obtaining the Jefferson Highway day at the Louisiana state fair last month.

Milwaukee did itself proud at its motor show with a showing of motor fashions. A parade with special attention to sport cloths was conducted daily.

Mrs. Earle W. Hadlock has the distinction of having ridden in a real live White motor fire fighting-machine on its initial trip from the Boston office of the maker

Beauty Hints for the Woman Motorist



No. 18

A MUSH made of raw cornmeal and sour milk is soothing to reddened hands. Oatmeal and soap in tepid water will clean the hands, when soap alone might irritate them. A mixture of glycerine, rose water and benzoin is also a good, simple cleanser. The mixture should be rubbed on softly. Cold cream, of course, is well known as a cleanser. However, be sure to know your cold cream and know that it contains nothing injurious to your skin. The cream applied with small pieces of cotton does wonders with the worst of hands. Sleeping gloves are a good accessory to include in the outfittings of your car.

If your hands receive some stain from tinkering you will find these suggestions helpful. When available, fruits are good. They not only cleanse but beautify. Tomatoes, strawberries, watermelon, cucumbers and lemons—doubtless the list could be even longer. Olive oil can beautify your hands also through application every night. Care must be taken in its selection, too, as the impure olive oil will darken the skin and produce hairs. Hot milk also is used.

to Augusta, Ga. The trip was a honeymoon trip, and the novelty of the transportation is explained by the need of prompt delivery and by the willingness of the young couple to see that it was delivered promptly.

Chicago woman motorists are especially lucky since the Golf Shop, a concern that carries much of interest for motoring apparel, has opened a woman's shop in one of the largest Chicago specialty shops buildings.

Mrs. W. C. Rose and Miss Mary L. Parker, Rock Island, Ill., are two woman motorists with long tours ahead of them. With Doctor Rose they intend to be out five months, following the Logan-Lee highway from Springfield, Ill., through Paducah, Ky., to Nashville, Tenn., at which place they will start to follow the Dixie highway and the Diagonal trail to Miami, Fla. They will go west to New Orleans from Miami over the Jefferson Davis Memorial highway and return over the Burlington Way, this making five organized highways which they will use.

The official organ of the Jefferson Highway Association plans to publish a series

of historical articles on the states through which the Jefferson highway goes, and the first one, which is on Missouri, is written by Mrs. George E. McIninch of St. Joseph, Mo.

You can decide for yourself whether you have a crow to pick with the powers that be in regard to clothes. From the results of the annual convention of the National Association of Clothing Designers, which was held in Cincinnati, Ohio, recently, we learn that men's clothes will change little next fall and winter. The same double breasted sack coat of this year may be "redded up" for next year, and all that you need do to his sack coat is to put a ruffle on to make it between 33 and 31½ in. long, hoist the belt a little or take the belt off, and there you—and he—are. Overcoats are to be raglan and ulsterette again, and the ulster or trench type will be 46 in. long and the box coat 42 in. However, don't let this worry you. You can wear coats of this kind, too, along with those of the great variety promised for women.

She Learned How

SHE sent for a lot of catalogs, and then she studied them. After much indecision she decided to buy a four-seated runabout, thinking that she could turn the corners better in the shorter car. Then she announced that she was going to learn to run it and do the ordinary, routine road repairs.

So far, so good. For an instructor she turned to an old friend, a much traveled friend, who could talk Rome and Athens and Paris but never had been West. Why she didn't get an instructor from among the men belonging to the company that sold her the car she didn't say. She merely announced she was going to learn to run it and do the road repairing, and she found the best educated instructor she could to teach her.

Garage Furnished First Scene

The first day the scene lay in the garage, newly built for her particular use. With the rear wheels jacked clear of the floor and her instructor's eye on all her motions she went through the operations of starting, shifting gears and so on as if she were actually on the road. She enjoyed it immensely.

The second day she and the instructor drove out into the country, the instructor at the wheel and her hand on the wheel to feel the motion of steering.

The third day she drove 5 miles down a wide road, landing at the garage after barking both trees at the entrance to the drive and narrowly missing a corner of the house. But she got the car in the garage and shut the door.

Then she went in the house and called up her friends to tell them she had learned to drive the car and it was easy as everything.

The Tamiami Trail

By Ruby Andrews Myers

'Neath the palm trees, under live oaks, trailing through
the stately pines,
By the lakes where red men bivouacked, decked with
verdant, odorous vines;
From the gulf-side to the ocean, wonderful as fairy tale,
Are the legends of the beauty of the Tamiami trail.

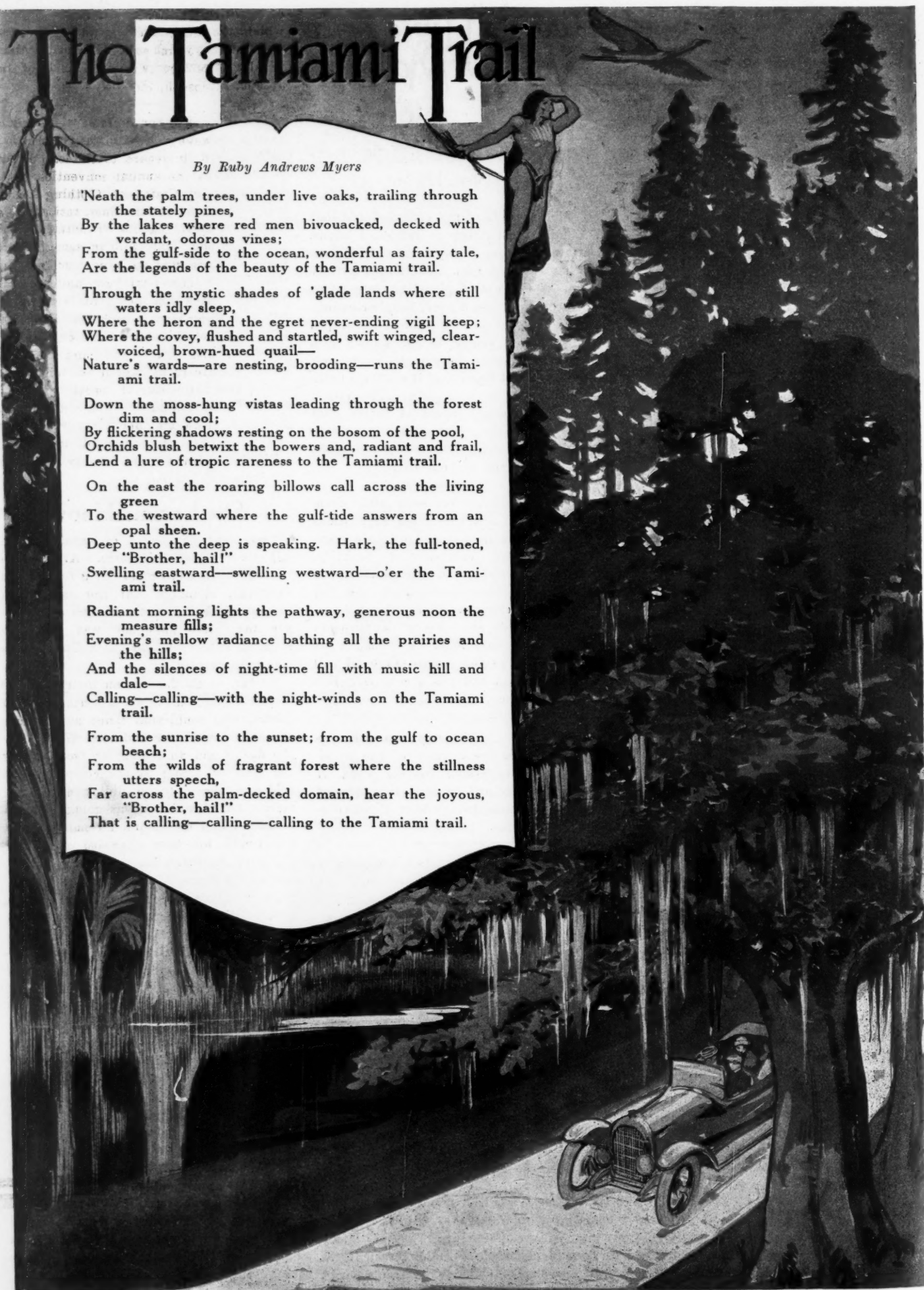
Through the mystic shades of 'glade lands where still
waters idly sleep,
Where the heron and the egret never-ending vigil keep;
Where the covey, flushed and startled, swift winged, clear-
voiced, brown-hued quail—
Nature's wards—are nesting, brooding—runs the Tami-
ami trail.

Down the moss-hung vistas leading through the forest
dim and cool;
By flickering shadows resting on the bosom of the pool,
Orchids blush betwixt the bowers and, radiant and frail,
Lend a lure of tropic rareness to the Tamiami trail.

On the east the roaring billows call across the living
green
To the westward where the gulf-tide answers from an
opal sheen.
Deep unto the deep is speaking. Hark, the full-toned,
"Brother, hail!"
Swelling eastward—swelling westward—o'er the Tami-
ami trail.

Radiant morning lights the pathway, generous noon the
measure fills;
Evening's mellow radiance bathing all the prairies and
the hills;
And the silences of night-time fill with music hill and
dale—
Calling—calling—with the night-winds on the Tamiami
trail.

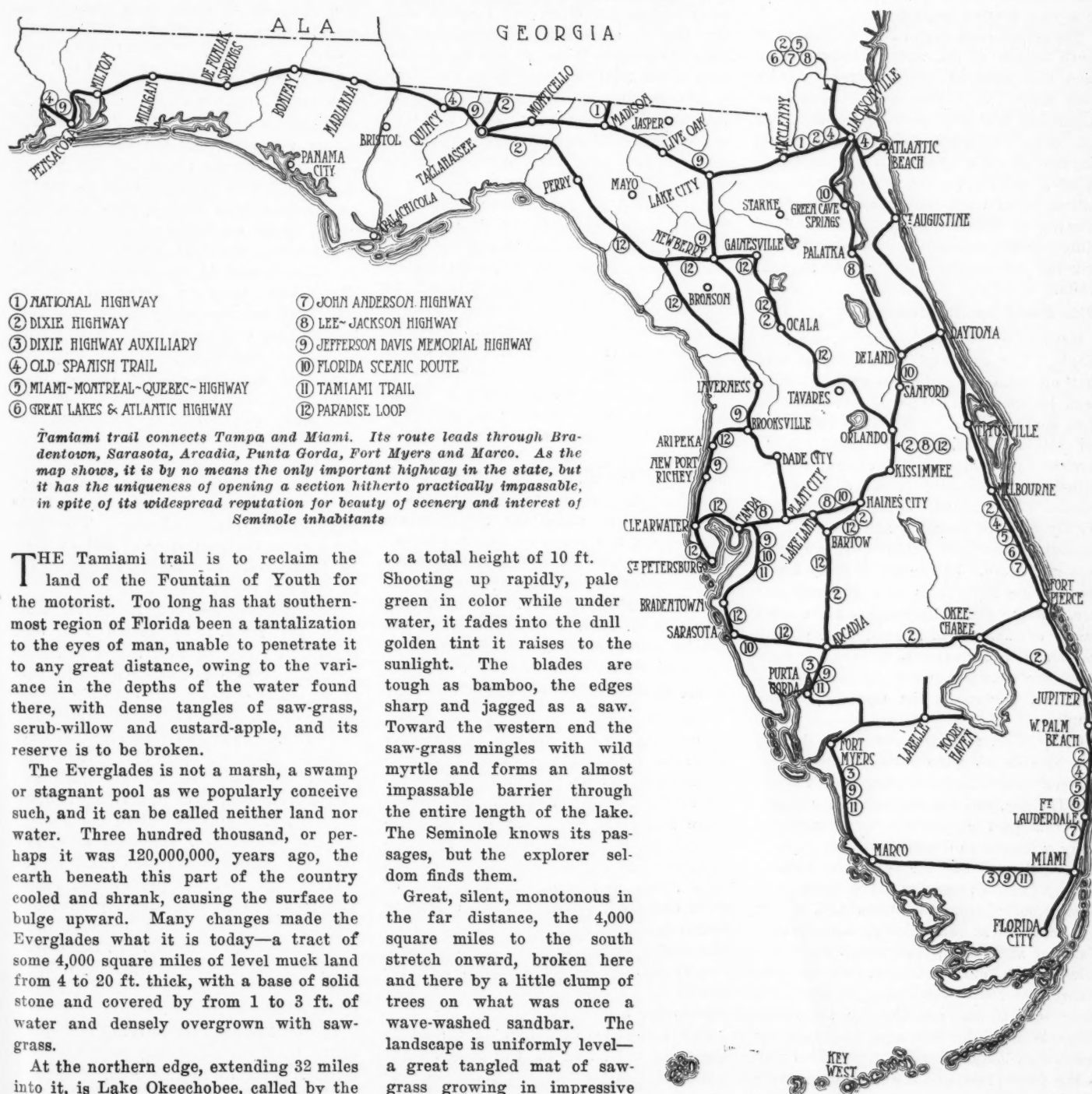
From the sunrise to the sunset; from the gulf to ocean
beach;
From the wilds of fragrant forest where the stillness
utters speech,
Far across the palm-decked domain, hear the joyous,
"Brother, hail!"
That is calling—calling—calling to the Tamiami trail.



When Writing to Advertisers, Please Mention Motor Age

How Tamiami Trail Came Into Being

What the Road Builder Had to Do to Conquer the Everglades' Stubbornness



THE Tamiami trail is to reclaim the land of the Fountain of Youth for the motorist. Too long has that southernmost region of Florida been a tantalization to the eyes of man, unable to penetrate it to any great distance, owing to the variance in the depths of the water found there, with dense tangles of saw-grass, scrub-willow and custard-apple, and its reserve is to be broken.

The Everglades is not a marsh, a swamp or stagnant pool as we popularly conceive such, and it can be called neither land nor water. Three hundred thousand, or perhaps it was 120,000,000, years ago, the earth beneath this part of the country cooled and shrank, causing the surface to bulge upward. Many changes made the Everglades what it is today—a tract of some 4,000 square miles of level muck land from 4 to 20 ft. thick, with a base of solid stone and covered by from 1 to 3 ft. of water and densely overgrown with saw-grass.

At the northern edge, extending 32 miles into it, is Lake Okeechobee, called by the Indians Lake Mayaimi, an irregular body of water 130 miles north and south and 70 miles east and west, with a bed below sea level for the most part. Its warm waters guard the tender vegetation of the South and help make the beauty which conceals the undesirability of the Everglades. Over the rocky bottom of the lake itself is also a layer of muck, formed of alluvial deposit and decayed vegetation, and in this muck saw-grass takes root and grows

to a total height of 10 ft. Shooting up rapidly, pale green in color while under water, it fades into the dull golden tint it raises to the sunlight. The blades are tough as bamboo, the edges sharp and jagged as a saw. Toward the western end the saw-grass mingles with wild myrtle and forms an almost impassable barrier through the entire length of the lake. The Seminole knows its passages, but the explorer seldom finds them.

Great, silent, monotonous in the far distance, the 4,000 square miles to the south stretch onward, broken here and there by a little clump of trees on what was once a wave-washed sandbar. The landscape is uniformly level—a great tangled mat of saw-grass growing in impressive silence.

It was long thought the chief products of the Everglades were always to be Seminoles and alligators. A Spaniard, Escalante de Fontenada, was the first white man to enter this mysterious region, but little was learned from his 17 years' sojourn there as slave to the great cacique Calos, who captured him when shipwrecked. Many expeditions have been sent out by the United States, but all failed. The explorers re-

ported the Everglades fascinating but to be avoided, a forest of trees, rank undergrowths and saw-grass, impenetrable and practically valueless. The lake itself was said to be only a mixture of currents leading nowhere in particular and generally ending in a comparatively still pool with a labyrinth of passages from which no egress is.

But all this has changed. The Seminoles

and alligators are still products of the Everglades, but other products have been added to keep them company. In spite of the intense hunt for the alligators for their skins, they are still abundant. While no figures as to the number of Seminoles are available, they are supposed to number about 1,500 and to live on the remote islands, where they fish, hunt, trap and farm to a very limited degree.

The reclamation began July 8, 1906. The south branch of the New river was deepened and widened for drainage. Canals were made. In 1 year 10,000 acres were reclaimed, and the growing of tomatoes and other vegetables began. The actual commercial value of the soil was computed at \$6 a ton for the nitrogen in it. Four million acres were found suitable for the growing of sugar cane, and the lack of killing frosts promised opportunity for the growing of bananas and other tropical fruits.

Wide Sunny Spaces Always

Many think of the Everglades as a dark jungle. The contrary is true. It is said that no malaria-bearing mosquitoes breed here, because their type do not breed in open sunny spaces. And the growths are not all of shade, either. Hundreds of acres are covered with live oaks and bays, with wild cucumber, lemon and orange trees. The papaya, custard-apple, and prickly ash are common, and the cabbage palmetto, pine and rubber-tree are seen here and there. The egret, ibis and heron once awoke the echoes of the Everglades also, but the plume hunter has made them nearly extinct. Fish abound in the fresh waters, and terrapin and flat soft-shell turtle are plentiful, while the wild turkey adds his gobble to the mystery of the tangles.

Deer, otter, alligator and crocodile live side by side with the sinuous snake. But the most interesting residents are the Seminole Indians, who for centuries have inhabited this part of Florida, in defiance of many attempts to dispossess them.

The shores of the streams flowing through the Everglades have their own vegetation. Cocoa-plum trees and, where the earth is somewhat dry, the coontie-plant, or arrow-root, from which the Seminole gets his flour and starch, form borders. Mangroves shade the rivers as they find their way to the sea through the rocky channels worn by the ages and torn by modern drainage. The mangrove gives way to the cocoa-plum, and the cocoa-plum gives way to cypress, while pond lilies help make the scene of shifting green in which the lemon-like foliage of the cocoa-plum, the dark olive of the mangrove and the lighter green of the cypress cast their tinted shadows in the sunlight.

When the waters are low, the numerous islands and unstable stretches show tall, golden grass, gleaming in the sun and fading into the blue of the horizon. The climate knows no extreme of heat or cold,

and the mysterious beauty so peculiar to the Everglades is constant. The rainy season covers June and September, but the nature of the soil is such as to absorb the surplus waters that fall on the drained sections. Malaria, the usual accompaniment of the swamps and marshes we consider kin to the Everglades, is absent.

The Tamiami trail will not tell the whole story of the difficulties this tract of mystery and the unusual have offered each attempt to conquer them. Though the greater part of the trail will lie through the Everglades, beginning at Tampa, the city of split wood for quick fires, on the west and ending at Miami, the palm-shaded entrance beautiful to the Everglades, on the east.

About \$750,000 have been appropriated for the work, which is not only to open up a road for motorists through the Everglades, but to make possible more complete drainage. The construction will not be finished until 1918, and the total outlay is placed at more than \$1,000,000. With the exception of the bridges at Punta Gorda and Bradentown, a well-graded road, with a large part of it surfaced, will be ready from Tampa to Marco early in 1917, however. The contractors already are beginning the work of erasing the traces of the months of battle spent in conquering the muck and water of this section. Grass seed has been sowed along the embankments of the road, and property owners are dotting the wayside with palms and other tropical trees and foliage, so that by the time motorists can travel this way, only canals, small lakes and fertile fields will remain where once lay an impenetrable jungle of water, muck and mud.

Where Beauty Was Undesirable

The beauties of the Everglades proved a stumbling block in the way of highways in Florida for years. No rules of road engineering have been able to meet the problem of constructing the trail. Scrub mangrove and grass muck may give pleasure to the eye, but to the engineer it is the pleasure that hurts. The leaves on the trees shake and tremble. The mass of muck and mud, 12 ft. deep and extending hundreds of feet in every direction, quiver. The dredge engine finds its work difficult. For it is a 40,000-lb. machine, and the stretch is very unreliable. How it was done makes a tale in itself.

The motorist can follow this road to Marco in 1917, and he will miss all the thrills of this battle. But if he go soon after it is opened, he may see the brown bears, wild cats and other natives of the jungles, who frequently came within 200 yd. of the workmen to satisfy their curiosity as to what new creatures had come to share their solitude.

A great variety of road methods were necessary. In the 10 miles north of Marco cypress strands underlaid with boulder and bed rock; pine ridges of boulder and the hardest of hardpan; sand banks of clay;

rock ridges outcropping on the surface; cabbage palmetto land; scrub buttonwood; prairie land flooded in the rainy season; flat-woods land; saw-grass land; marsh-grass land; soft blue marl and shell land; all varieties of mangrove land; swamp land; tide flats; tide lands 1 to 2 ft. under water at high tide; bog lands; mud holes; muck ponds; creeks; rivers; bayous, and channels — these were some of the combinations the engineers had to cope with.

Land Was Drained Also

A land dredge machine of steel beam construction was used. It had a cubic yard dipper and straddled the canal and ran on its own tracks under its own power. The track was in 4-ft. sections pinned at the ends with flexible steel couplings, so the dredge could run on uneven ground. The tracks were 29 ft. apart, and a canal 24 ft. wide and 12 ft. deep was possible. The width, however, depended on the amount of material necessary for the roadbed, and the depth was kept constant with an idea of drainage.

Cutting through, jungle tangle, marl mass, sand, etc., were dumped to the side. The dump was leveled to grade and surfaced by hand with hoe and shovel. Through Williams Island jungle the cutting had to be made through thousands of switches, poles, brush, interwoven ferns and bamboo, rattan and vines. The clearing was at contract price of \$44 an acre, and some stretches could not be cleared for three times that.

The finished roadbed is 18 ft. wide with 1½ slope, 6-in. crown and 3-ft. beam. In removing rock ledges and stratum, explosives were used. The major part of the material was soft, so the big bucket on the dredge did all the excavating down to bed rock. The bed rock stood 30 days after being thrown up to dry. When thoroughly dried and settled, the pick and shovel crew went over it, leveling it down a little above grade to allow for rolling. A roller weighing 7 tons was used, and after the sub-grade had been rolled a rock surface of 12 in. was put on and rolled. The rock was then scarified, graded and rolled. Twenty-four-inch culverts were placed about every 600 ft. In Dade county, the heart of the Everglades, a 20-ft. spur road for a turn out will be provided about every 600 ft. also.

The trail is not only to bring the motorist to the Everglades, but to bring commercial profit to Florida also. The lack of drainage and accessibility has let hundreds of thousands of acres in the Everglades lie worthless for years. Experts claim that this plot contains the most fertile soil to be found in the world. The construction of the Tamiami trail removes all obstacles. The methods used to excavate the canal and throw up the rock and other material for the roadbed and deposit the unsuitable material, such as decayed vegetable matter, on the side does it.



The Motor Car Repair Shop



Process of Lapping Cylinders

WHERE a cylinder of a motor car engine has become worn slightly out of shape or where the rings do not bear equally on the surface of the cylinder wall, the defect may be remedied to a great extent, or entirely, depending on the magnitude of the defect, by lapping the cylinder wall. This measure will not cure the cylinder which has become scored. It applies only to one which has been worn a very few thousandths of an inch out of round.

The job can be done satisfactorily only with the use of an old piston of the same bore as the cylinder which is being worked upon. If one does not have the use of a drill press the hand operation, which will give a very satisfactory job, should be done as follows:

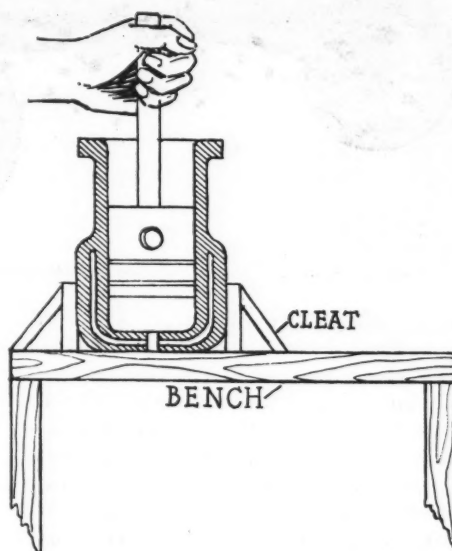
Support the cylinder in its inverted position on the work bench. Inasmuch as practically all motors of present-day construction are of the block-cast type, it is quite necessary that this heavy casting be substantially supported in an upright position in order that the lapping may be done most conveniently.

Cleating Cylinder Casting to Bench

Probably the best and easiest way to support the casting is by cleating to the bench as shown in the figure. If the motor is a four- or six-cylinder block-cast type, use three sets of cleats on each side. These consist of a block of wood laid against the side of the cylinder block and clamped in place by wooden pieces mitered off at a 45 degree angle, the mitered edges of one end nailed to the block and the mitered edges of the other end nailed to the work bench. This cleating will support the block substantially.

Before proceeding with the work one must determine that the old piston to be used is the proper fit in the cylinder for the job at hand. It must not be a tight fit, one which requires considerable pressure to move it up and down. On the other hand a real sloppy fit is going to mean uneven grinding and a great deal more work to get the proper lapped surface.

The piston should have a connecting rod fitted into it, or better still a rod of such a length that it will protrude about 18 in. above the top of the piston. If one contemplates an extensive business in cylinder lapping by the hand method it would be well to fit up a number of standard-sized pistons with rods such as described above. The connecting rod itself, however, will serve well if the jobs are so few that they do not merit the special tools.



Showing method of cleating cylinder block to a work bench for lapping of cylinders and method of holding rod and old piston in the lapping process

With the cylinders blocked up on the work bench and a suitable piston at hand one is ready for the lapping operation. There are several pastes on the market made up of fine emery and an oil body which are excellent for lapping work. However, one can make the necessary material himself with very fine emery dust and ordinary motor oil, with a bit of graphite worked into the paste. This compound should be made up to the consistency of mucilage and applied to the walls of the cylinder to be lapped and to the surface of the piston to be used for the lapping.

Applying the Paste

When applying the paste watch the surface upon which it is being applied with great care, especially if the paste has been made up previously and allowed to stand around the shop for some time. It is very easy for metal chips and filings to be dropped into the paste, and if these get into the cylinders when the lapping operation is under way they are liable to scratch the surface.

Lower the piston into the cylinder and proceed with the lapping. In performing this, lower and raise the piston, at the same time maintaining a circular motion. In other words oscillate it up and down into the cylinder. Turn the piston around occasionally so that all the surfaces will be brought to bear.

This operation should be continued for

a period from 15 to 30 minutes depending on the condition of the cylinder interior. It will not remove scratches and scores and will not iron out a warped or egg-shaped cylinder, but it will dress down the small humps and impart a very smooth, glass-like finish to the cylinder walls. Repeat the operations to each of the other cylinders.

If the repair shop is equipped with a fair-sized drill press, lapping can be performed quickly on this machine. It is especially easy when one has to deal with separate cast cylinders inasmuch as these can be clamped into the drill-press bed without need of special supports. However, if the job is a block cylinder casting, one must provide some means of support outside of the drill-press bed and inasmuch as it is a matter of blocking from the floor, it is for the ingenuity of the repairman to devise the best method.

In drill-press lapping of cylinders it is, of course, necessary that a rod be used to take the place of the connecting rod, this rod to fasten to the wrist pin at one end and be so shaped as to lock into the chuck of the drill press at the other end.

Drill Press Lapping

It is well to cut a block of wood which, when dropped into the inverted cylinder will come up to the line which marks the top of the piston stroke. To lap the cylinder, the old piston is coated with the lapping paste as previously described and let down into the cylinder. The drill press must be operated at its lowest possible speed. When the lapping is going on the drill press arm should be let up and down so that the position of the piston is constantly changing within the cylinder. Of course, the lapping can be accomplished in about half the time with this method that it can be with the hand method.

At the completion of hand or machine lapping the cylinder interior should be thoroughly washed out with gasoline and the inner surface polished with a soft cloth. It is imperative that all emery be removed from the cylinder, as this grinding compound would undoubtedly injure the bearings or some other part of the motor after the motor was assembled and being run.

If a repair shop is equipped for cylinder reboring, the lapping process is the logical completion of a reboring job. It is now a simple matter to rebore and finish cylinders by hand with the use of a hand reboring tool and the necessary equipment to take off the rough spots by lapping the cylinder walls.

The Readers' Clearing House

SPEEDY FORD THOROUGHLY BUILT Many Alterations in Motor, Chassis and Body Give Speed

SPRINGFIELD, ILL.—Editor MOTOR AGE—In reply to your request in the Dec. 7 issue of MOTOR AGE I give you two views of a Ford racing car which was built at our shop at Springfield Ill. See Fig. 1.

The motor is stock, bored out to 4 in., making it a 4 by 4 motor. It was rebored and fitted with special light pistons at our shop. The pistons are $\frac{1}{8}$ shorter than the Ford pistons. The cylinder walls, after reboring, are a little over $\frac{1}{8}$ thick. We have pulled in a large car on high gear without the slightest strain on the walls whatever. The cylinder head is a stock head with a special plate made to fit inside of same with holes for the valves to lift without striking. The space between the piston and the plate that goes inside of the head is $\frac{3}{8}$ in. when on top center. A stock camshaft is used and the exhaust valves are set 47 deg. before center, equalizing both sets of valves. We rebored the valve ports $\frac{1}{4}$ in. larger and use a 2-in. exhaust pipe projecting through the hood. We made a special intake manifold and use a $1\frac{1}{2}$ -in. Holley carbureter with auxiliary air valve running up to the steering post for making the mixture leaner or richer. It is made of $\frac{3}{8}$ standard pipe. We use from 3 to 5 gal. of cylinder oil in the crankcase without smoking. We also use a reserve tank which holds 2 gal. of cylinder oil which can be turned on by means of a cock. The oil is forced from the tank to the front of the timing gears by a pressure pump on the cowl.

Frame Is 9 In. Lower

The frame was lowered 9 in. and the motor 13 in., making a straight line drive, taking the friction off of the universals. The drive shaft was shortened 16 in., thus strengthening it and eliminating friction on the shaft. We neither use a fan nor extra water supply and never have had the water boil as long as it was half full. It has been run as long as 9 hrs. without a stop.

We use a 2 $\frac{4}{7}$ gear ratio in the rear axle and a ball and thrust on the ring gear, taking the friction off of same on a turn.

This machine is fitted with 30 by $3\frac{1}{2}$ non-skid tires and demountable rims. The wheelbase was shortened 14 in. and will take an ordinary 1-mile track at a speed of 65 m.p.h. A Bosch magneto DU 4 type is used for ignition and always starts on the third quarter turn-over as the motor has too much compression to spin.

This car has been driven about 1000 miles and I find it successful for both pleasure and racing purposes. It went 52

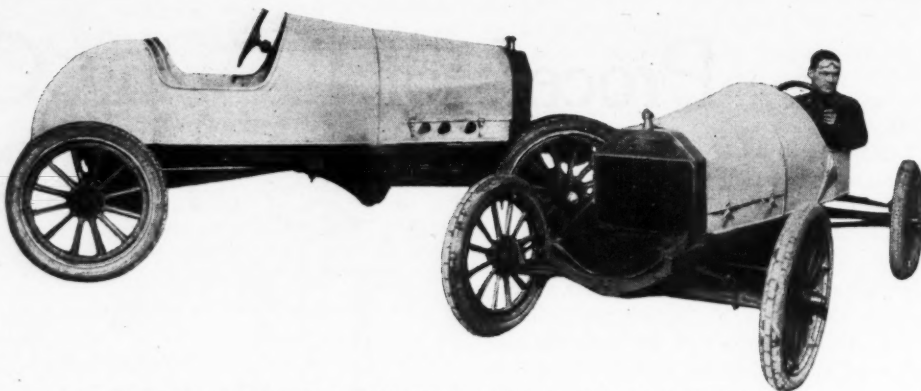


Fig. 1—Note the seat arrangement of this rebuilt Ford. The frame was lowered 9 in.

m.p.h. on the 1-mile dirt track at the Illinois State Fair grounds, Springfield, in soft sponge dirt up to the rims, and over a 4-mile stretch went 75 m.p.h. the last mile. We believe this car will travel 80 miles per hour on the Chicago speedway.

The body is of our own design and made of 20 gage metal. The gasoline tank holds 10 gal. and will run 27 miles on 1 gal. Everything was built at our shop. This machine can be duplicated for \$700.—Hollis Machine Shop, 114 East Washington St., Springfield, Ill.

FASTEST KANSAS HALF-MILER Rebuilt Ford, the Wampus Cat, Wins Races in Corn Country

Fredonia, Kan.—Editor MOTOR AGE—I am sending a description and a photograph of my Ford racer as asked for in a recent issue of MOTOR AGE. See Fig. 2.

This car has proved itself the fastest half-mile track car in the state of Kansas and I have offered for over one year a standing challenge to any car in the state to race 5 miles on any half-mile track, car for car, with no takers.

This car is the result of three years' practical experience gained from campaigning on the half-mile tracks of Kansas. In this time I only lost three races, one from mechanical trouble, one caused by throwing a tire and one by withdrawing after the race started on account of the extremely bad condition of the track. In all of these I led until retiring.

The special parts in this car are the wheels, gear ratio, body, valves, magneto, camshaft, carbureter, intake manifold, exhaust manifold, tappets, water circulating pump, pistons, piston rings and oiling system. The wheel base is 85 in.

All of the parts, except carbureter, wheels, magneto and differential gears, were made by myself in an ordinary garage. The only tools required were the usual hand tools found in any shop, small lathe, drill press and a small molding outfit. I melted my aluminum on a forge.

The wheels are for 28 by 3 tires. All tires are securely bolted on by tire lugs.

A special gear ratio of three to one is used on half-mile track with the small wheels.

The valves are of tungsten steel with $1\frac{1}{4}$ -in. heads.

The valve springs are given more tension by compressing to a greater extent.

The camshaft gives a lift of $\frac{3}{8}$ in. to all valves. The intake opens 10 deg. after top center and closes 50 deg. after bottom center. Exhaust opens 50 deg. before bottom center and closes 20 deg. after top center. This gives an overlap of 10 deg. This timing I found to be the best out of six trials.

Pistons Are Designed Specially

Pistons are of special design and are made of alloyed aluminum weighing 14 ounces each. The heads are domed to conform to the shape at the cylinder head after the cylinder head was planed down $\frac{1}{8}$ in., which is all that it will stand. The pistons were made to extend to within $\frac{1}{100}$ in. of the top. The piston pin makes its bearing directly in the aluminum with perfect results. The allowance for expansion between piston and cylinder is .008 at the skirt, .010 at first landing and .020 at the top. This makes a sloppy fit, but is absolutely necessary for track work.

Carburetion is by a Rayfield of $1\frac{1}{4}$ in. size, connected to the motor by an aluminum manifold of the modified ram's horn type, which is found most suited to this motor because there is not the tendency to load up that there is in the conventional design of the same size. The oiling system is of the circulating splash type. Oil is fed by a plunger pump placed in the flywheel pit and actuated by an eccentric placed on the rear end of the camshaft. A dam is placed at rear end of crank case to increase the oil level. A mixture of Mobiloil A and castor oil is used. Ignition is by high tension magneto through suitable plugs. I find Bosch mag-

neto and plugs satisfactory. The gasoline tank is placed on the left side of car next to the frame and holds $3\frac{1}{2}$ gal. Gasoline is fed by air pressure. An auxiliary oil tank holding 3 gal. is carried under the cowl. The oil is fed to motor by means of a hand pump.

The motor is very severe on its bearings and, in fact, all parts of the car. Before every important race where the stake is large and the competition dangerous, I replace such parts as crankshaft, valves, valve springs, steering arms and spindles and rear axle shafts, because these parts are never safe after they have been used a few times on a half-mile track. I can duplicate this car for \$500, but I had to throw away several hundred dollars worth of parts in the course of its evolution to a racer. It has returned all this money, however, many times from its winnings.

Racer Is Good Road Car

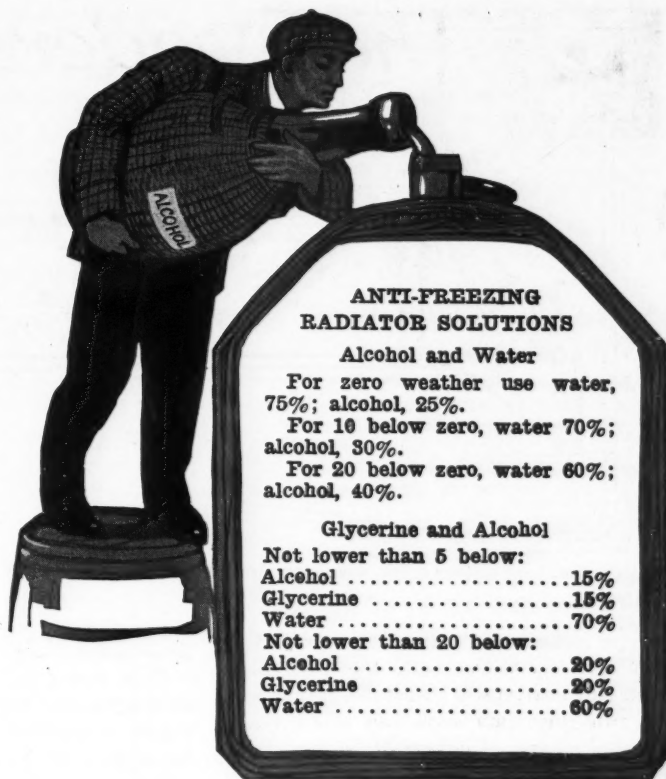
While I built this car for racing purposes, still it makes a nice road car if I care to use it for this purpose. The motor throttles down very nicely to about 18 m.p.h. on high and will go faster than 70 with 3 to 1 gear ratio and the small wheels. The acceleration is extremely rapid from 30 to 60 m.p.h. These speeds are made on dirt roads. The maximum speed on a half-mile track is about 60 in the stretches.

I want to warn those who build their motors similar to mine of a few things. You must keep your total weight as low as possible if you want a racer, because it takes power to move weight and weight puts a strain on tires and axles.

Be very careful in selecting your spark plugs. The compression of this motor is over 100 lb. to the sq. in. Consequently, the heat coming in contact with the plugs is very high and if there is any part of the plug that becomes red hot it will cause premature ignition with disastrous results. Do not use plugs with long or many electrodes. You cannot use plugs of the double-petticoat type. Don't try to use mica plugs because they are liable to frazzle.

I notice that the failure of most Ford racers is caused by insufficient lubrication

If you
are
bothered
with
percentages,
just put
1 gal. of
alcohol
in 3 of
water.



and I want to caution you that the stock Ford lubricating system will not work in racing practice. The vibration of the motor keeps the oil from passing down the oil tube and the flywheel does not throw as much oil at high speed as it does at low. You will have to use some kind of an oil circulating pump.

I will be glad to answer any question not made clear to anyone if they will send stamped envelope with their address written.—Roy Gillett.

Do Not Use Kerosene

Peoria, Ill.—Editor MOTOR AGE—What is your opinion about the use of kerosene in radiators in winter?—E. U. Henry.

MOTOR AGE has always discouraged the use of kerosene as an anti-freezing compound for the radiator, principally because of its harmful action on the rubber hose connections. Alcohol and glycerine are the only things advised.

No Kerosene in Radiator

Enden, Ill.—Editor MOTOR AGE—Advise me how kerosene should be put in a radiator in

place of water to prevent freezing on the road. I have seen where kerosene is all right to fill your radiator with, but am a little afraid to try it.—Ross Gripton.

MOTOR AGE does not advocate the use of kerosene as an anti-freeze for use in the radiator. It is harmful to the rubber hose. Use alcohol and glycerine.

Wants Four-Passenger Maxwell

Logan, O.—Editor MOTOR AGE—I want to alter the body of a 1917 Maxwell. Can one buy a four-passenger roadster body to fit the Maxwell chassis, and what would be the approximate cost?

2—What would five 30x3½ wire wheels cost?—C. E. B.

1—We know of no one making a four-passenger body which would fit this car. You would probably have to have a special job and it would cost you in the neighborhood of \$300.

2—About \$30.

Oldsmobile Pinion Setting

Two Rivers, Wis.—Editor MOTOR AGE—How can the hum in the rear axle of a Model 54, 1914 Oldsmobile be eliminated?—W. E. Suettinger.

On this model the pinion shaft complete with bearings is mounted in an adjustable

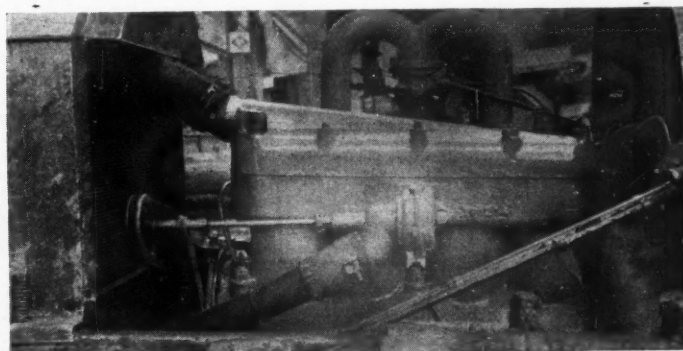


Fig. 2—This Ford is said to be the fastest half-mile track car in the state of Kansas. The motor was considerably altered as described in the builder's story

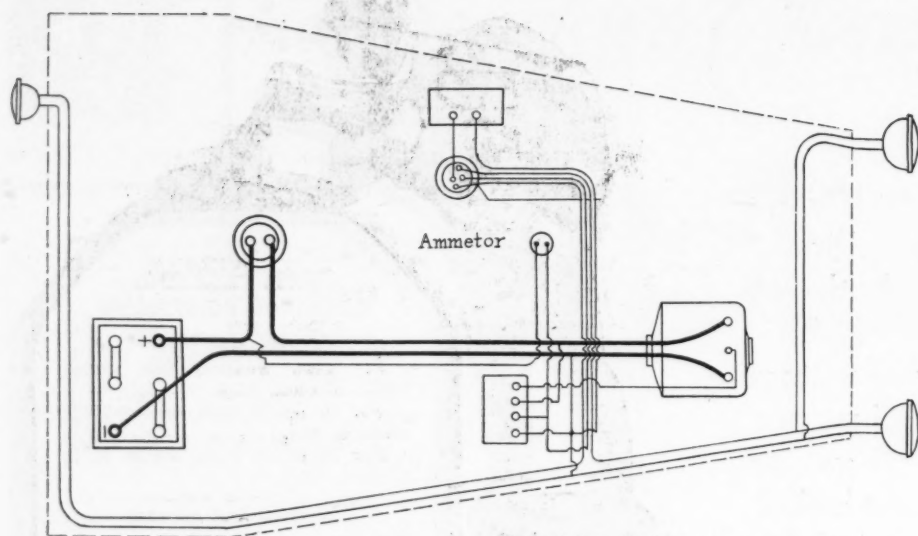


Fig. 3—Showing where ammeter should be cut into circuit of Detroit system on Seaton four

carrier locked by a plate with a projection and four cap screws; also the differential with ball bearings is adjustable either way by two ring nuts with cap screw locks. By this means, of course, it is possible to bring the pinion shaft in until the pinion and ring gear mesh, adjusting the ring gear to the correct mesh. In practice about 5/1000 back lash was given between the teeth. The cap screws for adjusting the ring gear will be found directly in front of the differential housing and those for adjusting the differential one way or the other may be got at by removing the back plate of the differential housing.

A MOTOR HANDBOOK LIKE KENT The S. A. E. Data Sheets Are Nearest to Mechanical Engineer's Book

Detroit, Mich.—Editor MOTOR AGE—What has become of the Porter-Knight racing cars? Are they being developed or not?

2—Why do manufacturers put the constant mesh gears, in a transmission, always at the front of the box?

3—Give the name of a hand-book for a motor car engineer, such as Kent's hand-book for the mechanical engineer.—Ben Parsons.

1—What has become of them we know not. As far as we are informed they are not being developed.

2—Because this is the logical place for it; nearest where the driving force enters, thus minimizing strain.

3—Of course the best handbook is found in the data sheets of the Society of Automobile Engineers, but these are only available to members of that society. There is no other book of a nature corresponding with Kent.

OPERATING PRINCIPLE OF METER Previously Used Delco Instrument De- scribed and Shown in Section

Minneapolis, Minn.—Editor MOTOR AGE—Publish a diagram of the internal arrangement, connections, etc., of the ampere hour meter which was used by the Delco starting and lighting system during 1913 on the Oakland and some few other cars. This device was made and the patents controlled by the Sangamo Meter Co., of Sangamo, Ill.

I and, perhaps, thousands of other mechanics and electricians understand what the device is supposed to do and how to take care of it. The point in question is, what is the principle involved in the driving of the meter? It is

not a meter such as is used in ordinary electrical practice.—W. H. Hunt.

This meter is what is known as the mercury-motor type and consists of a thin copper disk rotating in a horizontal plain in a pool or bath of mercury, through which current passes. The repulsion between the lines of force produced by the passing of current through the disk and the lines of force of a set of permanent magnets, which also provide the necessary brake for the disk, causes the meter to revolve at a speed roughly proportional to the current passing through it. On these meters it was found desirable to compensate for the difference in efficiency in the storage battery when charging and discharging, and what is known as the compensating pole with a coil around it was added to the meter so as to make the recording instrument operate more slowly when indicating charge than when indicating discharge. A section of this meter is shown in Fig. 4.

HINTS ON SECOND-HAND BUYING Major Things to Look for When Selecting Used Car

Mason City, Ia.—Editor MOTOR AGE—What kind of an examination would MOTOR AGE suggest giving a second-hand car before buying it? I have never owned a car, but have been reading MOTOR AGE for several years.—R. E. Patterson.

See the answer to A. C. McGrady's inquiry, published on these pages. In addition to this we would suggest that you try to wobble the wheels by pushing back and forth on the top surface. If there is a looseness the wheel bearings are worn or need tightening. If the car is electrically equipped, examine the storage battery carefully. If the case is rotted out and there are green deposits in evidence, something is leaking and the battery may be practically worthless.

Have the starter operated several times and make sure that it turns the motor over vigorously. Examine all wiring you can see, looking for worn or shredded insulation.

If there are any cuts in the tires pry

these apart and see how deep they are. If they are down to the fabric or have scratched the fabric, the tire is not going to be very long lived. Examine the casing where it enters the rim. If there is evidence of rust you can be quite sure that this rust continues inside and the tire is probably rotted and rim cut or well prepared to rim-cut when any driving is done.

Have all wheels revolved rapidly when on a jack and look for wobble. A waving wheel is indeed hard on tires and bearings.

Look for leaks in the gasoline tank and gasoline piping.

CRITICIZES OUR FISH PICTURE Says Photograph Depicts Wanton Slaught- er of Water Dwellers

Hutchinson, Kan.—Editor MOTOR AGE—I want to criticize you for inserting such an unsportsmanlike picture as you show on page 8 of Dec. 14, 1916 issue, where three or four hundred fish are shown.

No true sportsman would slaughter the finny tribe in that manner and it is certainly offensive to our sense of humor to see a picture like this in MOTOR AGE.

The rest of the article and pictures are fine and I enjoyed it very much. I love to fish and hunt, and that may be the reason why I am against wanton killing of any wild game.

A hundred and fifty years ago the American Indian might have been excused if he could have had a camera and taken a picture of three or four hundred scalps taken from the heads of his enemies and published and sent broadcast over the world. But fish are not our enemies. Please print this, and see if it does not meet the approval of your readers.—H. G. Welsh.

Ford Speedsters Illustrated

Yoakum, Tex.—Editor MOTOR AGE—I want to make a classy little speedster or racer out of a Ford. Kindly publish a design for an attractive body, and would appreciate any suggestions you might have to offer. How about electrical equipment?—E. H. Wehmann.

MOTOR AGE is and has been for a number of weeks publishing photographs and descriptions of rebuilt Fords. These have been built over by MOTOR AGE readers. We suggest that you study them for the ideas which might best strike your fancy. In a few weeks a summary of all these is going to be published in what appears to us to be the ideal rebuilt Ford. This assortment of ideas gives you a large number of options than we could suggest to you.

Internal-Gear Drive

Dallas, Tex.—Editor MOTOR AGE—What is the advantage in using flat springs or inverted springs as on the Republic truck, and is this strictly in accord with the best engineering principles?

2—What are the advantages and disadvantages of the internal gear drive for commercial cars?—A. Mills Cameron.

1—This is a good engineering principle. The construction gives a very solid spring support and semi-elliptic design is particularly good for trucks because of its strength.

2—Internal gear drive has as its talking points a positive spur gear drive to take the gear reduction instead of a bevel

reduction, and the possibility of using a dead axle to carry the heavy loads to which a truck is subjected. It may be readily seen that, inasmuch as the drive shaft to the wheel turns much faster in an internal-gear drive than in a bevel or worm drive, this drive shaft will have less load upon it—the twisting strain will not be as great.

COUNTERBALANCING FORD CRANKS Rear Axle May Be Made Stronger With Truss Rod

East Orange, N. J.—Editor MOTOR AGE—Would counterbalancing a Ford crankshaft be as practical and increase the power as much in proportion to size of motor as that of a Hudson Super-Six, provided valve areas were larger, motor equipped with overhead sixteen-valve attachment, and flywheel magnets removed?

2—Describe a little more fully on H. J. Lead's miniature Ford racer published in issue of Oct. 26, 1916, the spring suspension, extras on motor, gear ratio and half-mile track records.

3—Those who have raced Fords have had trouble with rear axles breaking on half-mile track work. Do you know any preventative outside of keeping as much weight off the rear as possible?

4—My Ford is standard tread and regular wheelbase with original spring suspension, Bosch and Rayfield equipped as well as Houk wire wheels, M. P. S. differential, 2 3/4 to 1 gears in the rear, aluminum pistons and special water and oiling systems and braced well both front and rear. I can do 70 m.p.h. straightaway, but cannot get the speed I ought to on half-mile tracks. Do you think it wise to narrow and shorten my car? Would this spoil it for speedway work if we should have any here in the east?—Roland C. Gifford.

1—Yes.

2—MOTOR AGE published all information given by Mr. Lead.

3—Put a truss rod under the rear axle. These are manufactured by a number of different makers and are available at any completely equipped supply house which specializes in Ford attachments.

4—A shorter wheelbase would be better both for dirt tracks and speedways. You will gain nothing by narrowing the tread.

SOMETHING ABOUT STEAM CARS

Previous Faults Have Been Swept Away and New Cars Are Efficient

Los Angeles, Cal.—Editor MOTOR AGE—There seems to be a revival of interest in the steam car, and I would like the opinion of MOTOR AGE as to the future of the steam cars. I have been a gas car enthusiast for 15 yrs. but recently had a ride in a Stanley steamer and have no doubt but that it can perform better than any gas car I have ever ridden in. What is wrong with the steam car? What are its limitations?

2—How long will the boiler or generator last?

3—Is the Doble generator an improvement? Are they cheaper to run and maintain? Have the automatic regulators on water level been perfected so that they do not trouble?—Eugene Ballou.

4—The perfected Stanley steam car has everything to its credit. Its limitations are no greater than those of the gas car and possibly not as great. The previous steamer faults, difficulty in firing up, delicacy of parts which were liable to cause trouble and frequent renewal of water supply, have been done away with in the new Stanley cars.

2—As long as the car, if properly cared for.

3—It is surely an improvement over the generators of a few years ago, if that is what you mean. This generator is very efficient.

4—For their weight and power they are cheaper to run than the ordinary gas car. With kerosene as a fuel one of the new types of steamers can maintain an average of 10 to 12 miles per gal.

Maxwell Bearing Renewal

Fayette, Ia.—Editor MOTOR AGE—Explain how to put in a new front magneto gear shaft bearing in a Maxwell 25, 1915 model.—A Subscriber.

Drain the water from the entire cooling system. Loosen the hose connections between the motor and the radiator, and remove from the chassis the radiator together with the front dust shield. Next, loosen the two bolts which hold the rear motor supports to the motor support

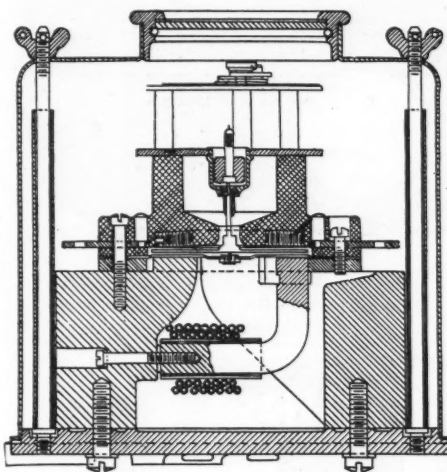


Fig. 4—Section through ampere hour meter used in old Delco equipment

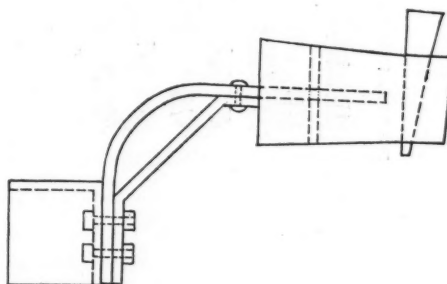


Fig. 5—Suggested home-made bracket for carrying extra wire wheel on rear of car

brackets which are riveted to the chassis frame, and remove the cap of the trunnion support from the front of the engine.

Raise and block up the front of the motor so that it is possible to remove the fan-driving pulley and the front gearcase cover which holds the magneto gear shaft front gearing. The old bearing can then be pressed from the gear case cover and the new one pressed into place. If necessary the bearing should be scraped or otherwise fitted to the shaft. In assembling, the order of work should be the reverse to that outlined above.

Cord Tires Best

San Francisco, Cal.—Editor MOTOR AGE—Which would be the best tire equipment on a Model D 6-45 Buick touring car, having 34x4 wheels, 34x4 cords, 34x4 fabric, 35x4 1/2 fabric? This is from the standpoint of economy, both tire and gas.

2—Which would be the best from the standpoint of speed?

3—From the standpoint of flexibility in hill climbing?

4—From the standpoint of comfort, easy riding, absence of tire troubles?

5—From an all-around view of the problem? This car is used 75 per cent of the time touring on the best and worst of roads at speeds up to 40 m.p.h.

6—Is a set of oversize much heavier than the regular size casings?—G. N. Loeb.

1-2-3-4-5—The 34 by 4 cords.

6—About 10 per cent.

TESTS WHEN BUYING USED CAR

Things to Look for in Motor and Gearset of Old Machine

Buckhorn, Wyo.—Editor MOTOR AGE—I have just sold my old Cadillac, but expect soon to buy another car. I cannot afford a new car, so thought I would buy a used one. Outline a few simple tests for determining the condition of the power plant and the gearset in a motor car when inspecting with the intention of buying—that is, tests that would determine the condition of the vital parts one is unable to see.—A. C. McCrady.

Ask that the motor be run and then listen very carefully for noises that sound like loose bearings or other misfitting parts. Have them open the throttle quickly with the spark well advanced. If the motor sounds as if it were knocking there is probably something loose.

Grasp the valve push rods where they come out of the valve lifter assembly. If they move about loosely the guides are worn. Look to the adjustment of the valves. If they are loose ask that they be tightened and you may find that they are already adjusted to the limit, or that there is no adjustment and new parts are needed.

When the motor is running examine the gaskets about the cylinder and carburetor very carefully for a leak.

Listen for noise in the timing gears. If it is excessive the teeth may be worn or broken.

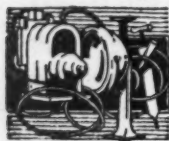
Put a puddle of water into each spark plug pocket and determine whether there is a leak around the plugs. If there is, find out whether it is just a faulty gasket on the plug or whether the threads in the cylinder are stripped.

Have the rear wheels jacked and the floor boards removed. Have the gears shifted or do it yourself with the motor running slow and then fast. Determine whether the gears shift readily or whether they grind before engaging. Grasp the propeller shaft directly behind the gear-box and attempt to move it backward and forward. If there is any play to speak of the bearings within the gearset are worn.

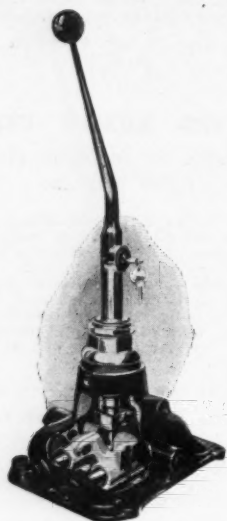
Ammeter on Saxon Four

Iowa City, Ia.—Editor MOTOR AGE—I have a Saxon four, model 14, which is equipped with a single-unit Detroit starting and lighting system less an ammeter. I have an Ever Ready ammeter and would like to know what are the necessary connections to show when the generator is charging the battery and also what the discharge is.—Kindly illustrate by diagram.—C. H. Jackson.

The wiring diagram in Fig. 3 shows where the ammeter should be cut into the circuit on this system. Connect the two outside wires on your ammeter.



The Accessory Corner



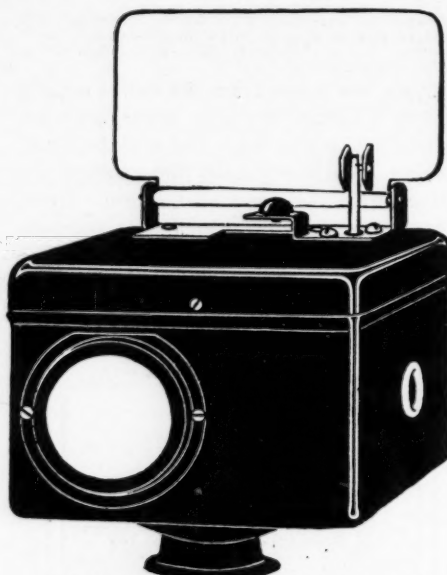
Gear-shifting lock for all cars with ball control levers

Compact Folding Tent

A COMPLETE and compact camping outfit available in sizes for all standard makes of machines is a product of the Genesee Mfg. Co., Flint, Mich. There is a 6-ft. clearance inside and a 4-ft. side wall under which one may sit comfortably in a chair. The maximum height of the tent at the side of the car is 7 ft. These tents attach directly under the side quarters of the top by means of grommets, which fit over the fasteners used on the tops for attaching side curtains. The tent is made of khaki shelter duck. Four stakes are all that is necessary to make this tent rigid. There is a bed having a helical spring end which is attached by means of web straps. It is equipped with snaps and take-up buckles and stretches from the top of the rear seat up to the steering wheel, making the bed 6 ft. long and 42 in. wide. The entire equipment can be conveniently packed in a rubber sack and carried on the running board. The price of the tent is \$17.50 and that of the bed, \$7.50.

Keystone Rubber Products

No-cement patches, vulcanizing fluid, reliners, blow-out patches, cut weld, boots, rubber cement, and army duck patches are listed among the new products of the Keystone Rubber Mfg. Co., Erie, Pa. The no-cement patches are packed in flat manila envelopes or in cans so that they may be carried handily in pockets or under cushions. The packages or cans contain twelve patches of three sizes with emery paper and cleaning cloth. A few drops of gasoline is all that is necessary outside of this equipment to apply a patch, although the Keystone vulcanizing fluid is made especially for this purpose and has its advan-



Signal device with red light for night and red sheet of metal for day



Comer safety signal, the invention of a railroad conductor

tage inasmuch as it is non-inflammable and affords a quicker and better application. The blow-out patch, as pictured, is made to take care of any possible trouble arising from all classes of blowouts.

Electric Signal Device

An electrical signal device to warn vehicles following that the driver is going to stop his car or make a turn is being put on the market by a new Denver concern. There is no complicated code to indicate what particular move the car carrying the signal is going to make, but a red light and a red sheet of metal serving as a flag, furnish a clear warning to traffic. The device is a pressed-steel box with a red lens in the rear side and metal flag on top. The box is 3 in. wide by 4 in. long and 3½ in. high and the raised flag adds another 3 in. in height. The solenoid operating the flag is connected with a button on the steering wheel, and the same circuit simultaneously lights the 4 cp. lamp in the box, thus making the lamp useful day and night.

Current from the storage battery operates the signal. The price is \$5 complete. Denver Traffic Signal & Mfg. Co., Denver, Colo.

Regulator for Headlights

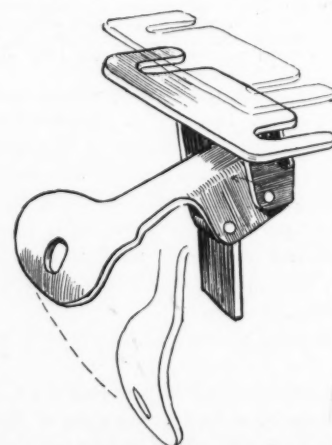
The Perrin Ford headlight regulator concentrates the light when the car is running under 10 miles an hour and the lighting current from the magneto is inadequate. When a Perrin-equipped car slows down, all available current goes automatically to the right hand lamp. When higher speed is resumed, the other lamp takes its normal share of the current, still automatically. The regulator can be installed in 5 min. with a monkey wrench and without change in the car's wiring or boring holes. The price is \$1. Perrin Mfg. Co., Detroit.

Comer Safety Signal

The Comer Auto-Stop signal is the invention of a railroad conductor after whose name it is being marketed by the Auto Signal Co., Chicago. It is attached to the tail light and license number bracket in the rear of the car and operates coincident with the working of the car's brake. Thus, whenever the driver presses his brake to slow down a semaphore appears from behind the license number flashing the word, stop. In daylight the word stop appears in white letters in a red metal board. At night the letters, which are made of opaque celluloid, are lighted from within by an electric light. It sells for \$12.50.

Foldable-Drain Top

A top provided with foldable drains or troughs which carry the water to the rear of the car and prevent it dripping or flowing over the edges of the top onto passengers in the car on entering or leaving, is a product of the D. G. Saunders, Jr., Saunders & Co., Kansas City, Mo. The con-



Device to compress Ford valve springs to facilitate removal of valves



The Victor heater is designed for use on Fords. The exhaust furnishes heat and installation is said to be a matter of less than an hour

struction of the foldable tops with the foldable drains under the Saunders patent is very simple and adds very little to the cost of the ordinary top. A narrow strip of the same material as the top is sewed along the edges thereof and upturned to form drain members, the walls of the drains being spaced and secured at intervals by studs or spacers. A wire insert in the seam of the front drain retains the curved portions of this drain in extended position, but does not in any way interfere with the folding of the top.

Johnson Gearset Lock

Johnson locks for Dodge, Buick, Paige, Jeffery and Cadillac cars will soon be available. The construction of these gearset locks permits their application to all makes of cars using a ball control lever. As one steps from the car he simply removes the key from the lock. This automatically drops a plug into the gear shifting arms, making it impossible to shift into any gear even with the engine left running. They are marketed by the Utility Mfg. & Advertising Co., Chicago.

To Warm Your Ford

The Victor heater uses the heat from the exhaust to send warm air into the tonneau through a floor register. The conduit has a heating surface of 100 sq. in. A valve regulates the amount of heat given off and is regulated in turn by a lever easily tightened to prevent accidental displacement by the foot. The heater is installed by taking up the floor boards and cutting a section out of the exhaust pipe, to which a permanent hinged fitting, with packing in place, is attached. The heater complete, with special packing between exhaust pipe and connection, and end boards to fit into floor, is sold for \$5 by the Victor Heater Co., Camden, N. J.

New Hill-Smith Accessories

The Minute demountable wheel for Fords is so named because of the speed with which a tire change may be made with this equipment as a part of the car. This is a true demountable wheel, not a demountable rim. To remove it, it is only necessary to unscrew one nut. The equipment requires that four special hubs be fitted to the regular Ford hubs. The

Ford wheels are used and the flange part of the new hubs is bolted to them with its powerful driving lug bolts. The two units of the hub lock together. The Minute wheel equipment retails for \$30. Another Hill-Smith product is the Letts manifold and is easily removable for the Ford intake manifold from the exhaust, of course to assist in carburetion. The heater clamps around the intake manifold, and is easily removable for cleaning. It sells for \$6. Both products are marketed by the Hill-Smith Metal Goods Co., Boston, Mass.

A Doormat for the Car

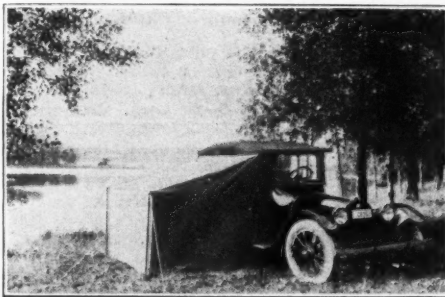
The "Ko-Ko" fits on the running-board on which the passenger steps before entering the car. It is of cocoa fiber in a black enamel steel frame and fastens with a locking spring clamp, eliminating drilling or screwing. Price, \$1.25. Continental Motor Equipment Co., New York.

Safety Starter for Fords

A new starter for use on Fords which bases its appeal to Ford users on safety of operation, simplicity of construction and low cost has been put on the market by the Pioneer Sales Corp., 1777 Broadway, New York. This instrument, which is known as the Barrett motor starter, presents the advantage that it releases automatically in case of backfire and that it has no parts or bearings which require lubrication.

Yale Triplex Block

The Yale triplex block is a chain hoist for the repairshop, with safety, speed and ease of operation as its features. The blocks are strongly constructed; the gear and pinion is made from a solid steel blank, carefully finished with large, cut teeth; the



How the Genesee tent appears when set up for a sleeping quarters

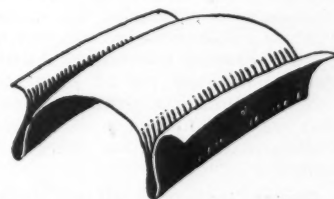
chain is steel, electrically webbed at the side of the link; the hook is an unbreakable steel forging designed to open slowly when seriously overloaded, and one man can lift a load of two or three times the rated capacity of the block. Yale & Towne Mfg. Co., New York. Price \$45.

Ford Valve Spring Compressor

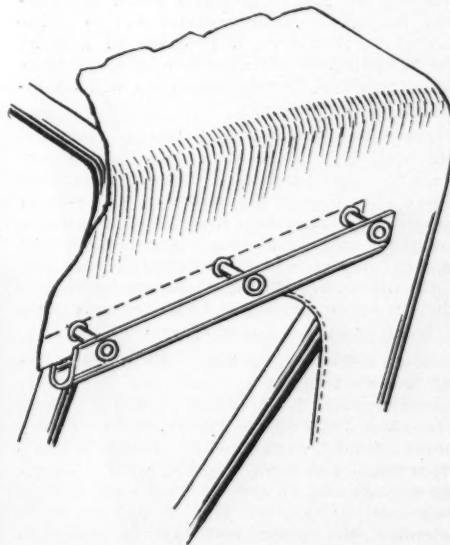
A new metal device for the Ford car makes it possible to compress two valve springs at once, remove the pins and lift out the valves, leaving the springs in position. It is inserted with two fingers and holds the springs securely so the valves may be ground without removing the springs. The shape of the device gives a powerful leverage, and the two springs are compressed at once with little effort. Using four compressors all the valves can be worked on at once. They sell for \$2 a set of four. Parrott Metal Stamping Works, Ohioville, N. Y.

Locks That Do Not Unscrew

The K-W Autolock switch is proof against negligence, because it is impossible to shut off the ignition without removing the key. Removing the screws will not remove the lock until the key is inserted. The switch fits over the regular Ford switch, entirely covering and protecting the hard rubber base, and can be installed in a few minutes. Each switch has a Yale lock and three keys. The device is approved by the Underwriters Laboratories and sells for \$3.50. K-W Ignition Co., Cleveland, Ohio.



A blowout patch which is a part of the new line of Keystone rubber goods



Section of the foldable-drain top equipment designed to keep water from the passengers and car interior

From the Four Winds

GASOLINE From Gas Maybe—The Utah-Wyoming Consolidated Oil Co. plans to spend half a million dollars on experiments on making gasoline and carbon black from natural gas. The company controls the largest gas well in Big Horn, Utah, basin.

Motor Robe Duty May Increase—The board of appraisers has ruled that motor car robes are not blankets and cannot be admitted as imports at the same rates. Unless the United States court of customs appeals overrules this decision the duty on motor robes will be increased.

Richmond Show Date—Richmond, Va.'s, first annual motor car show will be held in Richmond Gray's Armory Jan. 27-Feb. 3. The date is subject to change if armory is needed for mustering out regiment now on border, which does not seem probable at this time.

Dixie Highway Travel—In spite of the reported general ill condition of the Dixie highway, 100 foreign tourist motor cars travel up and down the highway daily when it is open to traffic, it is reported from Chattanooga. More than 100 a day entered Jacksonville over this route during December. Still others entered Florida through Tallahassee, Monticello, Live Oak and Lake City.

Madison Dealers' Show—The Madison, Wis., Automobile Dealers' Association selected Jan. 24-26 as the dates of the sixth annual motor show. Before this year the show has consisted of private exhibits in all salesrooms in the city. Visitors were transported from one to the other free of charge by the respective dealers. This will be the first time that the show has been held under one roof.

Flint, Mich., to Have Show—Flint, Mich., show dates have been set at Feb. 21-24. Most of the dealers have contracted for space already. The new coliseum does away with the old problem of place in which to hold a show, and present plans are for at least eighty models at that time. One-third of the receipts will be given to charity. E. W. Jeffers of the Chevrolet Motor Co. has charge of arrangements.

Show During Inaugural Week—Washington, D. C., dealers will show during inaugural week. The exhibition will be under the auspices of the Middle Atlantic Motor Association, Inc. As so many visitors will be at the capital at that time it is expected that all the 35,000 sq. ft. of available space will be taken readily. Commercial cars will be included in the displays.

International Motor Club Home—Motorists who visit New York soon may have a new place to stop in that city. The International Motor Club is now the owner of a five-story residence on Riverside drive, which is for a clubhouse and the headquarters of the International Motor Clubs' Association in New York. Members of the International Motor Club in other cities will have the privileges of the new club without extra cost.

Jersey's Reciprocity Real—While New Jersey motorists had to start out with 1917 licenses Jan. 1, the strangers within her gates were given full reciprocity by the New Jersey motor vehicle department. Pennsylvania's department has been troubled with a shortage of tags and on this account extended its time limit to Jan. 15. New Jersey promptly extended the same courtesy to Pennsylvanians within her borders. Several arrests have been made for failure to carry 1917 tags, but all citizens of other states which

for any reason did not make their license changes mandatory on the same date as New Jersey did were promptly discharged from custody.

Jersey Squire Who Annoyed Motorists Indicted—Squire Joseph F. Weeks, Pleasantville, N. J., who, it is charged, reaped a harvest in fines imposed on motorists who paid to avoid publicity and delay, but who later preferred charges with the state motor vehicle department, has been indicted by the

Atlantic county grand jury on thirteen counts, charging extortion and malfeasance in office. Squire Weeks was the nemesis of those who went in and out of Atlantic City and is one of the best known justices in the states.

To Urge Interstate Motor Law—Representative W. C. Adamson of Georgia—yes, the author of the 8-hr. railroad law—has drafted a bill which he will introduce at this session of Congress on the problem of interstate touring. The object is to get an interstate motor car law.

Old Trails to Be Improved—Deeds for strips of land through two Montgomery county, Missouri, farms make possible the changing of the Old Trail road between St. Louis and Kansas City so that the worst part, which is known as the Mineola Hills, will be eliminated. Work is to begin soon on the improvement.

Show to Honor Washington—When Duluth, Minn., holds its third annual motor car show during the week of Washington's birthday, the armory will be decorated in the national colors in honor of the first president. Present indications are that 125 cars will be shown, thirty-five more than last year. Motor trucks and accessories also will be displayed.

Los Angeles Cars Stolen, Too—New Year's eve motor car thieves stole nineteen cars in Los Angeles. Twelve were taken from in front of the Los Angeles Athletic Club, while two special watchmen were on guard. According to onlookers, who made reports to the authorities, the thieves made no special effort to conceal their work, but told those who questioned them that they had been sent from the garage to get the cars and keep them until the owners called. Later, three of the cars were found abandoned along suburban roads.

Joliet, Ill., Opposes Wheel Tax—Citizens of Joliet, Ill., filed their first referendum remonstrance, protesting against the new wheel tax ordinance recently adopted. There were 1,900 names signed, of which one-third were of women, and 400 names more than the legal requirements. The protest automatically stays the ordinance which was to have taken effect Jan. 1. The council has 30 days in which to take action. The law provides that unless the ordinance is repealed, it must be sent to a referendum vote of the people at a special or general election.

Los Angeles Tries New Plan—It is claimed that the system in vogue in Los Angeles has made it too easy for accused violators of the motor vehicle laws to "fix it," and the county supervisors have transferred the motorcycle division of the sheriff's office to their supervision. This means that instead of appealing to the officer, sheriff or court hereafter, the accused must appear before the entire board of supervisors at a public hearing and explain why he should not be fined. The motorcycle division has control outside of incorporated cities on the county highways only.

High Standards Set For Road Construction—Under the proposed laws that the New Jersey legislature expects to put through this winter, a high standard of road construction will be set up and each county will be compelled to build according to this standard if it gets any road money from the state. The new laws, which will be enacted at the earliest possible moment, will provide for a reorganization of the road department and a special tax for road funds. These laws are a part of the economy and efficiency program of the new state administration.

Coming Motor Events

RACES
—1917—

May 19—Metropolitan Trophy, New York speedway.

†May 30—Indianapolis speedway.

†June 9—Chicago speedway.

June 23—Cincinnati speedway.

†July 4—Omaha speedway.

†July 14—Des Moines speedway.

†July 28—Tacoma speedway.

August 4—Kansas City speedway.

†September 3—Cincinnati speedway.

†September 15—Providence speedway.

†September 29—New York speedway.

October 6—Kansas City speedway.

October 13—Chicago speedway.

October 27—New York speedway.

†A. A. A. championship events for 1917.

SHOWS

January 19-24—Manchester, N. H., show.

January 20-27—Detroit show.

January 20-27—Montreal, Can., show.

January 22-27—Oklahoma City show.

January 22-27—Rochester, N. Y., show.

January 23-27—Allentown, Pa., show.

January 23-27—Baltimore show.

January 25-27—Asheville, N. C., show.

January 27-February 3—Chicago show.

January 27-February 3—Columbus, Ohio, show.

January 27-February 3—Richmond, Va., show.

January 27-February 3—Portland, Ore., show.

January 27-February 5—York, Pa., show.

January 28-February 3—Wilmington, Del., show.

January 29-February 3—Buffalo show.

February 3-10—Minneapolis show.

February 5-10—Bangor, Me., show.

February 10-17—San Francisco show.

February 10-17—Hartford, Conn., show.

February 12-17—Kansas City show.

February 12-17—Louisville, Ky., show.

February 13-16—Grand Forks, N. D., show.

February 13-16—Fargo, N. D., show.

February 13-17—Sioux City, Ia., show.

February 14-17—Peoria, Ill., show.

February 19—Pittsfield, Mass., show.

February 19-24—Bridgeport, Conn., show.

February 19-24—Des Moines, Ia., show.

February 19-24—Duluth, Minn., show.

February 19-24—Grand Rapids, Mich., show.

February 19-24—St. Louis show.

February 19-24—Syracuse show.

February 21-24—Flint, Mich., show.

February 24-March 4—Atlanta, Ga., show.

February 26-March 3—Omaha, Neb., show.

February 26-March 3—Great Falls, Mont., show.

February 26-March 3—Utica, N. Y., show.

March 1-3—Urbana, Mich., show.

March 3-10—Boston show.

March 3-10—Washington, D. C., show.

March 6-10—Fort Dodge, Ia., show.

March 7-10—St. Joseph, Mo., show.

March 14-17—Davenport, Ia., show.

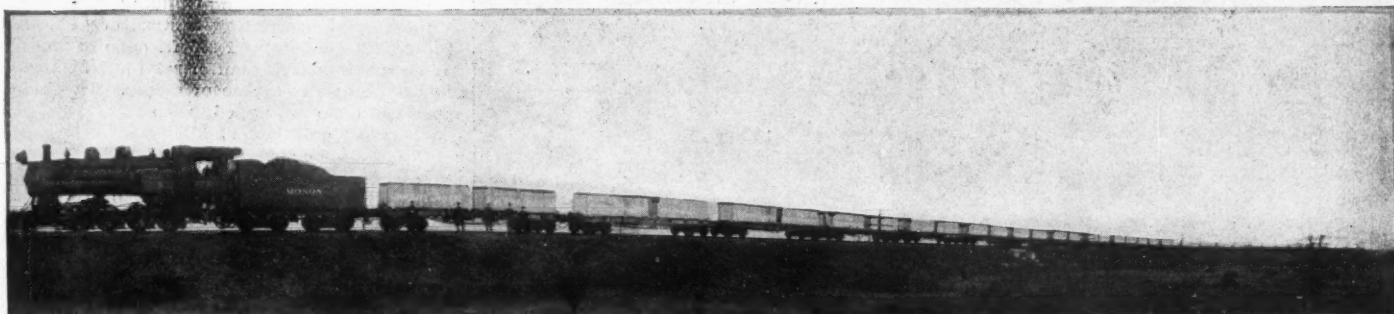
March 14-17—Mason City, Ia., show.

March 18-23—Cedar Rapids, Ia., show.

April 4-7—Stockton, Cal., show.



Among the Makers and Dealers



RECORD SHIPMENT TO FOREIGN COUNTRY—The train load of Pathfinders shipped from Indianapolis for Moscow, Russia, is said to be the largest shipment of motor cars from that city.

TAKES Agency for Premier—The Gilham-Pierce Motor Car Co., St. Louis, will handle the Premier cars.

Hilton Studebaker Retail Manager—E. S. Hilton has been made retail manager of the Studebaker branch in Detroit.

Starts with 350 Cars—The Fairchild Motor Co., New Orleans, will handle the Oldsmobile in Louisiana, Mississippi and Alabama. The initial order was for 350 cars.

Bonniwell Resigns from Auburn—C. A. Bonniwell, for the last 2 years assistant sales and advertising manager of the Auburn Automobile Co., Auburn, Ind., has resigned, effective Feb. 1.

Standard Tire Agency Organized—The Standard Supply & Service Co., St. Louis, has been organized to handle the Standard Four tire and conduct a service station and repair shop. George C. Huth is president.

Gildner Joins N. Y. Branch—H. H. Gildner has joined F. R. Blair & Co., New York, maker of the Flexite universal joints and couplings. He will be manager of the Flexite department. Mr. Gildner has been for the last 3 years chief engineer of the S. K. F. Ball Bearing Co., Hartford, Conn.

Virginia Product to Sell Retail—The Kline Motor Car Co., Richmond, Va., will open retail salesrooms. The Kline car is advertised as a Richmond product. R. H. Rawlings of Mount Kisco, N. Y., will be in charge of the retail rooms and the Virginia distribution.

Monson to Supervise Boyce Sales—Charles S. Monson, Detroit, has been appointed exclusive factory representative for the Moto-Meter Co., Inc., Long Island City, N. Y. He will open a branch office of the company in Chicago and continue the present office in Detroit.

Vincent Leaves Hudson—C. H. Vincent, experimental engineer for the Hudson Motor Car Co., Detroit, has resigned. He will have a similar position with the Packard Motor Car Co. Mr. Vincent was one of the three drivers who recently established a transcontinental record in a Hudson Super-Six.

Rose Gets Velle Promotion—Charles B. Rose, chief engineer of the Velle Motors Corp., Moline, Ill., has been promoted to be vice-president in charge of purchasing and production. W. K. Kennedy has been made assistant to Mr. Rose in charge of purchasing. I. H. Hazard, assistant chief engineer, becomes chief engineer.

Drop Forge Co. Renamed—The Ladish Drop Forge Co. is the new style of the Ladish-Obenberger Co., Milwaukee, Wis., which formerly was the Obenberger Drop Forge Co. John Obenberger withdrew several months ago and has founded a large

new drop forge plant, also devoted to the production of crank and camshafts and other motor car forgings, which is known as the John Obenberger Forge Co. The Ladish plant is in Cudahy and the Obenberger works in West Allis.

Gary Truck Agency Formed—The Gary Motor Truck Sales Co., St. Louis, has been organized to sell Gary trucks. R. D. Blum is manager.

Selheimer with Hal Company—D. C. Selheimer, formerly in charge of the motor and axle divisions for the Packard Motor Car Co., has been made factory manager for the Hal Motor Car Co.

Vance Becomes Purchasing Agent—Harold C. Vance has been appointed acting purchasing agent of the Studebaker Corp. to fill the place made vacant by the recent death of C. J. Reynolds.

Shaw with Automobile Crank Shaft—James T. Shaw, formerly treasurer of the General Motors Co., has purchased stock in the Automobile Crank Shaft Corp. and has been made the treasurer of that concern. J. M. Hibbard, formerly treasurer, will continue to act as general manager.

To Make Traffic Signals—The Singer Auto Traffic Signal Co., a Delaware corporation, has been licensed to use \$130,000 of its \$200,000 capital in Missouri. The company will open an office and factory in St. Louis soon. The devices, which display the words "stop," "slow," etc., by lighted signs on cars, will

be exhibited at the motor shows this winter. An ordinance recently adopted by the St. Louis board of aldermen authorizes their use under certain conditions.

New Orleans Westcott Agency Opens—The Sutter Motor Car Co., New Orleans, organized to handle the Westcott cars, has opened its show rooms.

To Sell Reo in New Orleans—The Sherouse-Steele Motor Car Co., New Orleans, has been organized to handle the Reo cars. Contracts have been let for a \$27,000 building.

To Sell Heating System—The Auto Sales Co., St. Louis, has been organized to sell the Wasco garage heating system and Maxo tires in that city. James H. Leiber is manager.

Garford Branch for St. Louis—The Garford Motor Truck Co., Lima, Ohio, which is capitalized at \$31,000,000, has leased a building in Kansas City, Mo., and will establish a branch factory there.

National Motor Supply Co. Sold—The National Motor Supply Co., Cleveland, maker of motor car accessories, has been purchased by the Painesville Metallic Binding Co., Painesville, Ohio.

Johnson Leaves Lovell-McConnell—Charles Johnson has resigned as factory representative of the Lovell-McConnell Mfg. Co. and has become a general factory representative with offices in Detroit.

Slater Changes Firestone Position—W. J. Slater, formerly manager of the sales promotion department of the Firestone Tire & Rubber Co., is now special representative of the general sales department.

Creel Joins Chevrolet Agency—C. C. Creel, factory representative of the Chevrolet Automobile Co. at Birmingham, Ala., has become sales manager for the Edwards Motor Car Co., Chevrolet distributor in that city.

Clutch Factory Is Moved—The Lasure Friction Clutch Pulley Co., Charles City, Iowa, maker of clutch units for gasoline engines, has moved its plant and general offices to Madison, Wis. The factory in Madison is producing 50 clutch pulleys daily. The company was organized two years ago.

Robinson Gets London Promotion—A. W. Robinson, formerly truck sales manager and director of the Locomobile Co. of America, Bridgeport, Conn., has been promoted from a director to the position of managing director of Gaston, Williams & Wigmore, Ltd., Alexandria House, Kingsway, London.

Chevrolet Branch Advertises Output—The Chevrolet Co. of St. Louis, last Sunday carried what is said to be the heaviest advertising in the newspapers in the St. Louis section. The advertisement appeared as four pages in St. Louis and in other cities as a three-page spread. The output of last year

Dividends Declared

Willys-Overland Co.—The Willys-Overland Co., Toledo, has declared a regular dividend of 3 per cent on its common stock, payable Feb. 1.

Chalmers Motor Co.—The Chalmers Motor Co., Detroit, has declared a dividend of 75 cents a share, payable Jan. 15 to stock of record Jan. 5.

Hupp Motor Car Co.—The Hupp Motor Car Co., Detroit, paid a quarterly dividend of 1½ per cent on 7 per cent cumulative preferred Jan. 2 to stock of record Dec. 20.

Signal Motor Truck Co.—The Signal Motor Truck Co., Detroit, paid a dividend of 3½ per cent Jan. 2 to stock of record Dec. 26.

United States Tire Co.—The United States Tire Co., New York, has declared a quarterly dividend of 2 per cent on first preferred and 1½ per cent on second preferred, payable Jan. 31 to stock of record Jan. 15.

Kelly-Springfield Tire Co.—The Kelly-Springfield Tire Co., New York, has declared a quarterly dividend of 4 per cent on common, payable Feb. 1 to stock of record Jan. 15.



CHALMERS CLUBS ACT AS SANTA CLAUS—This tells how the Chalmers Girls' and Men's clubs distributed Christmas supplies to Detroit poor.

was given as 10,301 cars, valued at \$5,000,000, and every car sold for cash. The St. Louis factory is turning out 150 cars a day.

Tracy Promoted by Oakland—W. R. Tracy has been made assistant sales manager of the Oakland Motor Car Co., Pontiac, Mich. Mr. Tracy has been with the Oakland company for several years and was formerly the manager of the Michigan branch.

Smelter Company Builds—The Progressive Metal & Refining Co., Milwaukee, Wis., maker of aluminum ingots and alloys, has broken ground for the first unit of a new plant with about 55,000 sq. ft. of floor space. The initial construction will be a building three stories high and 40 by 160 ft. in size.

Akron, Ohio.—Akron Biltwell Tire & Rubber Co.; capital stock, \$200,000; incorporators, M. Braley, J. F. Risch, L. E. Braley, Sam Desure, J. P. Reger, W. H. Kline and W. A. Young.

Ardmore, Okla.—Ardmore Rubber Co.; capital stock, \$1,000,000; incorporators, John C. Harmony, E. D. Ford, C. A. Besaw, A. C. Fox and R. G. Wood.

Bowling Green, Ohio.—Kenmore Motors Co.; capital stock, \$10,000; incorporators, T. E. Moore, F. C. Palmer, D. I. Ladd, N. S. Reed and C. A. Stump.

Buffalo, N. Y.—Lutz Motor Co., Inc.; to manufacture motor cars, trucks and aeroplanes; capital stock, \$100,000; incorporators, Edward F. Tanner, Morris Hendrickson and Fred White.

Cleveland, Ohio.—Overland Larick Co.; capital stock, \$10,000; to sell motor cars; incorporators, Jacob J. Larick, John Montana, S. S. Ford, Edgar R. Bayes and E. M. Kossin.

Cleveland, Ohio.—Cleveland-Jeffries Automobile Co.; capital stock, \$25,000; to sell motor cars; incorporators, W. C. Armstrong, Norman Elliott, David L. Shaw, A. M. Klein and Oscar S. Cramer.

Cleveland, Ohio.—Blair Auto Co.; capital stock, \$25,000; to sell motor cars; incorporators, Bert Blair, George Johnston, A. J. Mitchell, S. F. Dunn and Carl H. Koch.

Cleveland, Ohio.—Bryant Automobile Co.; capital stock, \$5,000; to sell motor cars; incorporators, Fred E. Pfeiffer, D. S. Conover, R. H. Senkbell, Willard J. Hayes and W. B. Lutton.

Cleveland, Ohio.—Woods Cushion Wheel Co.; capital stock, \$500,000; to manufacture motor car wheels; incorporators, Edward D. Woods, George H. Elchelberger, H. Koren, Herman J. Hord, Leif Koren and Frederick Schussler.

Dayton, Ohio.—Dayton Wire Wheel Co.; capital stock, \$250,000; incorporators, A. N. Wilcox, Louis H. Roggs, L. W. James, J. B. Coolidge and B. D. Moore.

Houston, Tex.—Armor Auto Agency; capital stock, \$10,000; incorporators, R. J. Armor, Mike Hogg and J. B. Imber.

Kansas City, Mo.—Double Drive Motor Co.; capital stock, \$500,000; incorporators, Theodore Dittmore, Walter Beck and S. B. Gatewood; to build and deal in motor cars, tractors and motor vehicles of all kinds.

Kansas City, Mo.—Elgin Motor Car Sales Co.;

The second unit, to be undertaken as soon as the first is completed, will be 80 by 160 ft., three stories and basement.

Mitchell Agency Builds—The Southern Motor Car Co., Memphis, Tenn., is erecting a building to contain an octagon-shaped showroom for cars and a garage. The total cost will be \$17,000. The company sells Mitchell cars.

Murray Surplus \$328,094—The J. W. Murray Mfg. Co., maker of hoods, fenders and other motor car parts, has offered its stock for exchange listing. The company has outstanding stock of \$10 par value amounting to \$350,000. The company's earnings in 1916 are approximately \$240,000, equal to about

Recent Incorporations

capital stock, \$10,000; incorporators, James E. Crawford, F. E. Casey and E. J. Tranlin; to deal in motor car accessories.

Lancaster, Ky.—Rex Garage; capital stock, \$8,000; incorporators, W. D. Hammack, W. F. Champ, R. P. Gregory and Henry Moore.

Lexington, Ky.—Franklin Motor Car Co.; capital stock, \$20,000; incorporators, William M. Phillips, B. F. Stone and Stanley Stone.

Lexington, Ky.—Commercial Auto Body Building & Painting Co.; capital stock, \$185,000; incorporators, Walter R. Williams, F. A. Forry and J. D. Happer.

Marion, Ind.—Marion Truck Corp.; capital stock, \$1,000,000; to manufacture motor vehicles; incorporators, C. G. Barley, J. W. Stephenson, S. W. Winder and G. C. Harwood.

Mattoon, Ill.—Mattoon Motor Car Co.; capital stock, \$20,000; incorporators, F. A. Brooks, W. E. Lumpkin and John McNutt.

Moline, Ill.—Browns Motor Co.; capital stock, \$20,000; incorporators, W. F. Brown, J. M. Robinson, L. E. Slausson, H. M. Hutten, G. L. Boston and P. A. Biggs.

Phoenix, Ariz.—Four Star Auto Signal Co.; to manufacture and deal in motor cars and motor car parts and accessories; capital stock, \$500,000; incorporators, I. J. Lipsohn and H. M. Harrison.

Phoenix, Ariz.—Tulsa Automobile Corp.; capital stock, \$2,000,000; incorporators, Thomas J. Hartman, Mark E. Carr and G. E. Darland; to

65 per cent on the capital stock. Its earnings for the current year are estimated at \$300,000.

Hood Tire Opens Branch—The Hood Tire Co., Inc., has opened a factory branch at Atlanta, Ga. R. C. Lees is local manager, and I. R. Hill, district sales manager, will make his headquarters at the branch.

Fisher Corp. Erecting Building—The Fisher Body Corp. is erecting a structure 5 stories high, 324 ft. long and 235 ft. deep of the flat slab mushroom system of reinforced concrete with an extra surface of maple. The building will be equipped with steel window sashes, automatic sprinkler systems and will be ready for occupancy by May 1.

Goodrich Gets Philbrin Position—I. F. Goodrich has been appointed manager of wholesale and retail sales of the Philips-Brinton Co., maker of the Philbrin system of ignition. He retains his position as general representative of the Globe Machine & Stamping Co., Cleveland, Ohio, and president of the Goodrich-Lenhart Mfg. Co., Philadelphia.

Large Truck Factory in Ireland—The Trafford Engineering Co. of England has taken an option on the city park of Cork, Ireland, with the conditional guarantee that it will build a factory to cost between \$1,000,000 and \$2,000,000 to make worm-driven motor trucks on a large scale and will employ more than 2,000 men at a minimum wage scale of 24 cents an hour.

Darland Joins Tulsa Corp.—G. E. Darland has been appointed secretary and general manager of the Tulsa Automobile Corp., Tulsa, Okla., a company organized with a capital of \$2,000,000 to make a new four-cylinder car, the Tulsa 4. W. A. King has been appointed general factory and production manager of the concern. Both men have been with other motor car factories.

Agency Gives Employees Stock—The Capital City Auto Co., Studebaker distributor in New Orleans and at Baton Rouge, has increased its capital from \$25,000 to \$125,000. As a New Year gift, fifty employees, who have been with the company one year or more, each received a share of stock, the par value of which is \$100. The company will move into a new \$40,000 building early in February.

manufacture, sell, import and export motor cars and parts and accessories.

Phoenix, Ariz.—Premier Tire & Rubber Co.; capital stock, \$500,000; to manufacture rubber, motor car tires and sundries; incorporators, Charles A. Spenny, Harry A. Hirst, W. C. Spenny.

Phoenix, Ariz.—McArthur Bros. Mercantile Co.; capital stock, \$100,000; to deal in motor-driven vehicles and machines of all sorts; incorporators, Charles H. McArthur and Warren McArthur, Jr.

Phoenix, Ariz.—Motor Transit Co.; capital stock, \$25,000; to carry freight and passengers by motor car; incorporators, H. M. Gallagher, M. E. Cassidy and J. A. Hobbs.

Pittsburgh, Pa.—Craven Automobile Grease Cup Co.; capital stock, \$10,000; incorporators, T. M. T. McKennan, James F. Craven and John M. Patterson.

Pittsburgh, Pa.—Samson Motor Co.; capital stock, \$50,000; incorporators, Allan W. Cruikshank, Harry G. Samson and Howard S. Samson.

Springfield, Ohio.—H. G. Root Co.; capital stock, \$25,000; to deal in motor car supplies; incorporators, H. G. Root, F. B. Woosley, E. E. Stanford, J. M. Rene and Allen H. Frost.

Springfield, Ohio.—Springfield Buick Co.; capital stock, \$20,000; to sell motor cars; incorporators, William E. Stevens, Sara B. Stevens, Charles B. Zimmerman, M. Ray Wiekart and Roy W. Roof.

St. Louis, Mo.—Colvin Automobile Institute Co.; capital stock, \$10,000; incorporators, A. C. Landon, L. L. Bigbee and Edwin Schiele; to conduct a motor car, aviation, farm tractor and mechanical school and to deal generally in motor cars.

Toledo, Ohio.—Interstate Motor Trucking Co.; capital stock, \$50,000; incorporators, Grover Luckey, William F. Gridley, A. A. Gridley, E. D. Oliver and Robert M. Oliver.

Toledo, Ohio.—Belmont Motor Car Co.; capital stock, \$125,000; incorporators, A. T. Wilson, R. W. Beachler, Andrew A. Lehr, B. J. Gantz and A. H. Miller.

Youngstown, Ohio.—Youngstown Tire & Accessory Co.; capital stock, \$20,000; to deal in tires and accessories; incorporators, E. F. Hollister, L. F. Pierce, J. D. Webber, F. S. Thompson and P. J. Eckenread.